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ABSTRACT

This book provides a platform for an array of educators to discuss the impact of professional development schools and other school-university partnerships on student learning. The 11 papers include: (1) "Using Research to Connect School-University Partnerships to Student Outcomes" (Lee Teitel); (2) "Making a Difference: A Professional Development School's Impact on Student Learning" (Gerald J. Pine); (3) "Expanding the Potential of School-University Collaboration: Special and General Education as Partners in Improving Student Achievement in a Rural Professional Development School" (Troy V. Mariage and M. Arthur Garmon); (4) "Student Achievement in Maryland's Professional Development Schools" (David H. Cooper and Christy T. Corbin); (5) "Turning Student Voice Into Student Outcomes" (Melinda Cowart and Joyce Rademacher); (6) "Student Learning Outcomes in a Partnership Intern Program" (Kathleen Sullivan Brown and Carole Heitman Murphy); (7) "The Impact of Professional Development Activity on Student Reading Performance" (Woodrow Trathen, Pamela Schram, Philip Shomaker, Jennifer Maldonado, and Tonya McKinney); (8) "Implementing an Outcomes-Based Collaborative Partnership for Preventing Reading Failure" (Shirley V. Dickson and William Bursuck); (9) "The Impact of Teachers' Participation in Collaborative Research on Secondary Students' Classroom Behaviors and Engagement" (Stephanie L. Knight and Daniel J. Boudah); (10) "STAR: Students and Teachers in Action Research" (Alice C. Sagehorn and Brenda G. LeTendre); and (11) "Making the Case: Lessons Learned From and About School-University Partnership Research" (Stephanie L. Knight and Donna L. Wiseman). (Papers contain references.) (SM)

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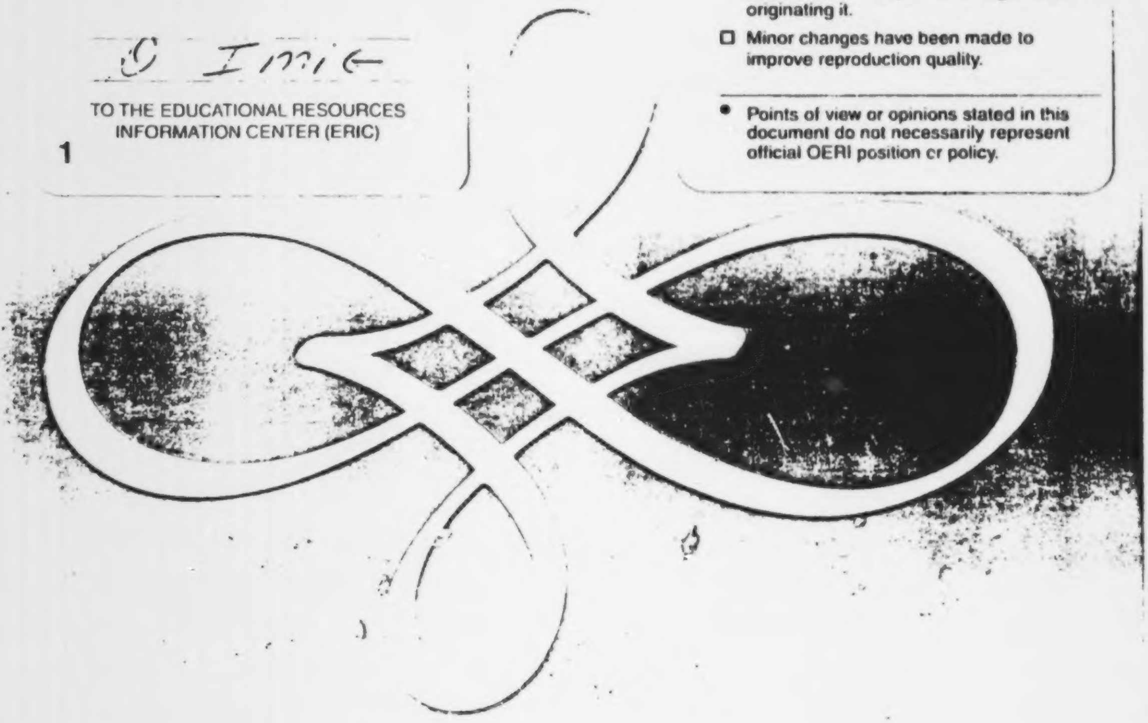

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FOREWORD

One of the most challenging developments of the past decade has been the growing insistence that every initiative in education must show that it produces gains in K-12 student learning. Student performance has become the single most important measure to judge the efficacy of any innovation. Despite the array of philosophical concerns and methodological problems inherent in using student performance as the measure of success, educators and researchers are seeking new ways to measure the impact on student achievement of innovations in curriculum, teacher quality, program structure, and pedagogy. This is a realistic response by educators to the expectations of today's policy makers and their insistence that student learning is the single most important determinant in judging education.

What, if any, impact school-university partnerships have had on K-12 student learning is a question that emerged only recently. It is a challenging question because of the difficulties of showing the linkages between teacher preparation and K-12 student outcomes and because of the evolving nature of the partnerships between schools and universities. While educators press for a wider range of measures to determine student success, they are also realistic about the demands of policy community.

During the past decade, educators have reinvented school-university partnerships. These collaborative efforts have reshaped teacher and principal preparation and produced significant change in both K-12 settings and colleges and universities. The literature on partnerships is expansive and growing, but little of it focuses on the impact that the collaborations are having on K-12 student learning.

That is what makes this volume so important. Determined to confront the difficult question of impact, Wiseman and Knight have assembled a set of papers that describe studies in nine different partnerships. The papers explore the methodological challenges of linking teacher preparation to student learning and point the way to an important new direction in educational research.

Wiseman and Knight suggest that these are "pioneer studies" because the authors are breaking new ground. They acknowledge that few studies show impact on elementary and secondary student outcomes but conclude that by raising the question Are we making a difference with K-12 students? the nature of the research shifts. They call for more such research and contend that in the quest to fashion evidence-based preparation programs, such research is essential. The challenges confronted and the successes found in this endeavor are evident in the studies in the following pages, and this volume is important for other teacher educators—particularly those invested in professional development schools and other partnerships—to know and appreciate. Indeed, Wiseman and Knight are themselves pioneers and deserve recognition for taking the lead in assembling these studies for us.

The emphasis on professional development schools (PDSs) following the 1986 publication of the Holmes Group's report has resulted in numerous theoretical articles, descriptions, and research reports about the nature and impact of school-university partnerships (Abdal-Haqq, 1998; Book, 1996). Several articles outline the perceived benefits for school and university faculty of participation in joint inquiry (cf. Darling-Hammond, 1992). In particular, the literature provides insights into partnerships' impact on teachers, future teachers, and (to a lesser extent) university professors as well as how schools and universities change as a result of their collaboration. However, most studies focus on processes, preservice and inservice teacher perceptions, and program features rather than on the students in elementary and secondary PDS settings (Abdal-Haqq, 1998; Book, 1996). Although almost all partnership goals include a stated emphasis on improved school achievement and student teaching (Freeman, 1996), few studies actually address the impact of PDS activities on student outcomes (Abdal-Haqq, 1998; Book, 1996; Valli, Cooper, & Frankes, 1997).

The hard work of partnership formation has resulted in some differences in the ways schools and universities go about their work. The most prominent changes include increased opportunities for future teachers to be involved in school settings (Shen, 1994; Teitel, 1992; Yerian & Grossman, 1993), evidence of curricular innovations in school and university teaching (Berry & Catoe, 1994; Wiseman & Nason, 1995), and more collaborative professional development activities for experienced teachers and university faculty (Book, 1996). The literature in current periodicals and books provides descriptions of theories, processes, issues, and challenges; gives us a sense of the variety of partnership efforts and the processes involved in partnership work; and indicates some changes in teacher and preservice teacher behavior and attitudes (Book, 1996). Even though there are a number of publications, the research and writing still does not provide a great deal of evidence about what and how specific K-12 teaching and learning behaviors change as a result of partnerships between schools and universities. Nor do we understand the short- and long-term effects on the young people who attend the schools where partnerships exist (Abdal-Haqq, 1998; Book, 1996; Murrell, 1998). Only three studies to date (Stallings, 1991; Houston, Hollis, Clay, Ligons, & Roff, 1999; Knight, Wiseman, & Cooner, 2000) have regularly been cited as examples of studies that focus on the impact of school-university partnership activities on student outcomes.

Challenges to School-University Research

There are many reasons why it is difficult to assess student learning in school-university partnerships. Difficulties emerge from a reliance on traditional research and inquiry practices, and there are many opportunities for research to be misunderstood, misused, or misconstrued (Zeichner, 1995). The need to build trust and collaborative processes between partners may interfere with the implementation of research and evaluation processes. Anything less than outstanding findings for PDS outcomes and processes can "… reflect badly on programs, teachers, and administrators …" (Knight et al., 2000, p. 27), causing many partners to avoid collecting and analyzing important data.

Not all the deterrents to research on student outcomes are related to the desire to preserve relationships. Trust issues aside, easy-to-obtain measures of student learning such as standardized tests may be too far removed from the focus and activities of PDSs to provide any meaningful information about student outcomes (Andersen & Herr, 1999; Cochran-Smith & Fries, 2001). Furthermore, in complex interventions such as PDSs, it is a challenge to isolate the variables that can be directly related to student outcomes. Often partnership activities are so complex that connections between activities and outcomes are difficult to establish. Given these difficulties, examples of partnerships that have overcome some or all of these challenges may provide excellent models for researchers in other partnerships.

The nine studies featured in this book also illustrate many of the challenges that have plagued the research associated with school-university partnerships. One of the major goals of partnerships is to make collaborative research an essential component of the partnership for both school and university participants (Wiseman & Nason, 1995). However, it is difficult to gain equality in research processes and share research responsibilities equally. Even in many of these nine studies in which complex, trusting relationships already have been developed, research in school-university settings appears to remain the responsibility and domain of the university faculty. Only in the case of partnerships focusing on action research do teachers appear to play a major role in the research process.

Another challenge involves the portrayal of research findings. Where research in school-university settings is emphasized, the temptation exists to provide a "dog and pony" show of results, accentuating only the positive aspects and outcomes of collaboration. This may be even more pernicious in the current environment, where accountability permeates our profession at all levels. One question related to partnership work in high-stakes accountability arenas involves the extent to which we can risk even discussing student outcomes. Partners involved in collaborative relationships always strive for positive results, but total success may be fleeting or difficult to achieve given the myriad other influences on K-12 students. Furthermore, the stories of frustrations, disagreements, and hard work done by school- and university-based educators "off the sides of their desks" are not often the focus in the literature. While we can learn as much (or more) from our lack of success as we do from glowing accounts of positive results, do we dare risk acknowledging the negatives? With few exceptions (see Bullough et al., 1999, for an example of what can be learned from the difficult aspects of school-university partnership activities), discussions of negative impacts or lackluster results are seldom presented. Few partnerships are strong or trusting enough to display less than positive research findings, especially when the findings involve K-12 students and their teachers.

In addition to engendering reluctance to risk negative findings, the accountability focus may force a narrow definition of research. Recent emphasis on state-mandated tests restricts our notion of student outcomes and discourages us from using a wider range of outcome measures to talk about classroom impacts. Furthermore, the emphasis on public disclosure makes test results easily obtainable through state agency Web sites. Five of the nine studies presented in this book use these tests as their primary outcome measure. Only the action research studies employ performance-based measures that present a broader view of the impact of partnership activities on K-12 student outcomes. However, the definition of scientific or rigorous research included in recent federal legislation and commissioned reports (cf. National Research Council, 2001; Wilson, Floden, & Ferrini-Mundy, 2001) most likely would preclude use of many action research studies as a legitimate way to report student outcomes.

The nine studies presented in this book represent unique partnerships; therefore, different models of research emerged as the partners attempted to answer questions about the impact of their efforts. To organize this text, the partnerships are grouped based on the descriptions of their collaborations and the focus of their research processes. The first four studies, presented in chapters 2 through 5, are identified as *comprehensive* reform efforts. The research in these efforts captures the impact of multiple collaborative endeavors in large contexts, and the research questions probe for more general impacts. Often, the work is extremely complex and interlocking and entails the consideration of a number of variables. The second set of three research studies, in chapters 6 through 8, look at *targeted* curricular reforms relating to reading instruction. In these studies, a single intervention narrows the research focus and makes the methodology clear cut. The last two studies, chapters 9 and 10, describe *action research* that captures the impact of school-university partnerships on student achievement.

The studies present in this text are, in many ways, research pioneers. Merely attempting to answer the question *Are we making a difference with K-12 students?* as they establish school-university partnerships to support teacher education curriculum and school-based reform places them in a select group. We were, quite frankly, surprised at how difficult it was to unearth studies that linked school-university partnerships with K-12 student outcomes. A national call for papers for this text yielded only 17 responses. Several sites had collected data regarding the impact of school-university partnerships on student achievement, but most were not suitable for publication. As many have documented, there is still not a strong research base that supports teacher education initiatives in general (Wilson et al., 2001) or partnerships specifically (Book, 1996; Abdal-Haqq, 1998).

The dearth of research investigating the impact of partnerships on K-12 students may be due in part to questions of appropriateness. Attempts to study connections between teacher education and K-12 student outcomes can be controversial. One risks viewing the linkages too simplistically without considering the complexity and priorities that are at the foundations of schools and universities (Cochran-Smith & Fries, 2001). No direct link may exist, particularly in PDS settings. Furthermore, making linkages between complex PDS activities and multiple variables that impact student outcomes may be prohibitive. Nevertheless, because the research process is not just about design and methodology (National Research Council, 2001) but also very much about reasoning related to building knowledge, we present these studies as an initiation of the discourse needed to advance knowledge in this area. It is but one step in furthering the dialogue about the future role of teacher education.

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Using Research to Connect School-University Partnerships to Student Outcomes

Lee Teitel, University of Massachusetts Boston

Jerry Pine begins the first research report in this book with a common lament about the paucity of research documenting the impact that professional development schools and other forms of school-university partnerships have on student learning. His is an important concern—a critical one, even—to the future of partnership approaches that require additional energy and resources yet may not show in credible ways the value that they add to the principal goal of improving student learning. It is a concern I also raised after repeated literature reviews I conducted (Teitel, 1995, 1996, 1998) in the late 1990s showed precious few carefully documented studies linking PDSs and student impacts.

Several years later, I am no less concerned about the importance or urgency of having credible, careful studies linking partnership formation to student outcomes. I am, however, more optimistic. Three important sets of developments in the last several years contribute to my sense of hope:

- Clearer connections are being made between school-university partnership processes and outcomes. Some of the chapters in this book contribute to my sense of hope in this arena as do some other recent publications and a number of ongoing sophisticated studies of partnership impacts.
- The recent development and release of standards for PDSs by the National Council for Accreditation of Teacher Education shows a maturation of the PDS partnership movement. The standards represent a critical convergence of what it means to be a PDS, with profound implications for documenting and assessing PDS-type partnerships.
- The climate of increased accountability has led to an abundance of student test data and some emerging assessments of teacher quality.

This chapter focuses on the state of school-university partnership impact research. The first part details the three aforementioned areas in which I see hope and progress. The second part of the chapter offers a conceptual model for research in school-university partnerships that focuses on student learning and that draws and builds on these three themes. Note that much of the discussion in this chapter specifically addresses research on the impacts of PDSs; where possible, links will be made to other forms of school-university partnerships.

Better Connections Between PDS Processes and Outcomes

In the early to mid-1990s, much of what was listed as research on PDSs was really about process—stories of the partnerships' development. Few outcome data were available. The few studies with some sort of outcome data frequently presented findings without context—"black-box" studies—providing no underlying definition of what might have been going on in a school-university partnership to lead to those outcomes (Teitel, 1998).

In the last few years, more studies are making important links between PDS processes and outcomes—looking at partnership formation as one link in a chain that, for instance, leads to improved student learning because the partnership is changing the experience that students are having. Some have found a "conceptual framework" or "logic model" developed with members of the Massachusetts PDS steering committee helpful in designing and implementing impact research studies. The broad strokes of that framework are included in Figure 1.1; for more detail and examples of how it has been used, see Teitel, 2000, 2001a.

The chief value of the model is that it steers researchers away from black-box studies and provides a framework to help organize and conceptually link the various kinds of process and product data that exist in partnerships. In a research environment where establishing causality through randomly assigned treatment and control schools is virtually impossible, the model provides opportunities for researchers and their audiences to make plausible links that suggest, for instance, that preservice teachers who have spent substantial portions of their internships working on collaborative teams with special education teachers will prove to be stronger collaborators and more skilled in working with a range of students than their peers who have not.

Many of the chapters in this volume use some sort of logical model to make connections between school-university collaboration and K-12 student outcomes. Two of the chapters refer explicitly to the conceptual map mentioned above. Pine does an excellent job of examining partnership development, restructuring efforts, and changes in student experiences that led to the substantial gains in student achievement in the Michigan PDS he studies. He uses the conceptual model to highlight how specific improvements to teaching and learning (e.g., the successful implementation of Beginning School Mathematics or thematic instruction) were intensified by the changes in structure and attitudes in the school. He describes the development of a PDS culture where a sustained, continuous program of assessment and evaluation was "guided by one driving question: Are school improvement and PDS activities making a difference for Longfellow student learning?"

David Cooper and Christy Corbin also refer to the four-column model, but for different reasons. After comparing Maryland PDS student outcome data (from a statewide standardized test) with data from carefully matched comparison schools, they found no significant differences in student test scores.

Figure 1.1. Conceptual Framework

Organizational innovation/ partnership development	Adaptations in roles, structures, and culture	Best practice in teaching, learning, and leadership	Desired outcomes improved learning for
School	Changes in governance, decision making, leadership	Classroom approaches "teaching for understanding" constructivism	All students
PDS	Use of time, roles, and rewards	Different expectations for teacher professional development	Experienced teachers and other education personnel
Teacher education program	Views of collaborative relationships, expectations	Different approaches to preservice teaching, fieldwork	Preservice teachers and other education personnel
(Also links to unions, parents, communities, districts, arts and sciences faculty)			

Note. Adapted from Teitel (2001a).

The authors note as one of the limitations of their study that while they had carefully used referrals from the state department of education's PDS directory and other ways of verifying that their PDSs were indeed PDSs, their methodology limited them to treating these multiple sites as black-box studies. They refer to the conceptual model but acknowledge that they had to "short circuit" it: Their broad-brush, comparative, multisite research design did not allow them to look at the "processes involved in every stage of the PDS implementation and [their] potential for effecting changes in learner outcomes."

Others in this volume develop and apply their own linkages between PDS processes and outcomes. For example, Kathleen Brown, Carole Murphy, Dan Natale, and Dan Coates begin by describing in detail the partnership formation and organizational underpinnings of their PDS. They go on to provide a four-column model of their own, linking each PDS activity (e.g., technology integration) with the strategic role it plays in their partnership (providing enrichment for reading across the curriculum). They then continue to make the linkage to outcomes for teachers and interns (learning and applying new techniques for classroom technology) and then ultimately for K-12 students (extending time on computers for increased reading, more individualized coaching, resulting in greater engagement in learning).

Similarly, there is a strong logic model in place when Melinda Cowart and Joyce Rademacher report how they brought student voices into the shaping of the student teaching experience. The students' suggestions for changes (e.g., they recommended that student teachers try other approaches to discipline in the classroom) not only led to different strategies for the interns, thereby enhancing student teacher learning, but had positive effects on the students' self-esteem, attendance, and other measures.

In their chapter, Troy Mariage and Arthur Garmon also describe thoughtful connections among the structural changes taking place (in their non-PDS partnership), the changes in curriculum and other activities engendered by the partnership, and outcomes for students, measured in a variety of ways. Furthermore, they describe how the data gathered have been used to loop back to the planning cycle, shaping decisions on future curricular choices.

I could continue, but the point will become clear as readers go through this volume that it represents a maturation in the field. The logical connections among inputs, organizational changes and processes, learning activities, and outcomes shown in most of these chapters add important depth to our ability to document and understand partnership work.

NCATE PDS Standards

In the mid-1990s, merely agreeing on what was and what was not a PDS was a major challenge to serious research on impacts. In her review of the literature for the *Handbook of Research on Teacher Education*, Book (1996) identifies this problem:

> The operationalization of what is meant by a professional development school continues to plague researchers' ability to clearly explain what impact the activities of a PDS are having on teaching, learning, school organization, and teacher education. As researchers and teacher educators, we are often at a loss to define when a school is actually a professional development school. (p. 204)

The Professional Development School Standards Project of the National Council for Accreditation of Teacher Education has taken a major step to address that problem. Working in a carefully iterative process with the "field" of practitioners in PDSs, the project developed and validated a set of standards (National Council for Accreditation of Teacher Education [NCATE], 2001b). The connection of the standards project to research was key from the beginning of this process. The original standards (called "critical attributes") were drawn from a national survey, focus groups, interviews, and a review of the literature. Draft standards were published and then field-tested in 18 PDS sites.

The field-testing was itself a form of research, with partnerships that were visited as part of a voluntary mock accreditation visit writing a self-study documenting evidence of their development along the five key areas of the standards: learning community; accountability and quality assurance; collaboration; equity and diversity; and structures, roles, and resources. When the self-studies were completed, the partnerships were visited by a trained group of school- and university-based PDS practitioners who again conducted a research mission—validating, collecting, and weighing evidence and forming conclusions. Each step of the way had strict rules for what constituted evidence (NCATE, 2001a).

But the standards are important in this discussion of impact research not only because the process of their development mirrored and promoted research. The existence of the standards settles the question of what it is that a PDS should be and do. Even though the standards are not (yet) officially part of the NCATE accreditation process, their impact has already been felt. Many PDS partnerships, including those not involved in the field test of the standards, have used them to self-assess, to examine issues of sustainability, and to focus research (cf. Rosselli, Brindley, Daniel, Hall, Homan, & Applegate, 1999). Some states, like New Jersey, have incorporated the standards into the language of their grant solicitations. Others, like Maryland, have adapted the standards and woven them into state policy as part of a redesign of teacher education.

Furthermore, the standards and the self-study process that accompanies them provide a framework for conducting local impact research, complete with focal areas and suggestions and criteria for collecting and synthesizing evidence. Because the PDS Standards Project represents the first attempt to look in a focused way at a form of school-university partnership, its value goes beyond what is useful to PDSs. By codifying through the standards what a collaborative partnership structure should look like, how issues of accountability and assessment should be addressed, and so forth, the standards frame key tasks that must be faced and addressed by other forms of school-university partnerships. These implications will be explored further in the second part of this chapter.

As the standards gain wider acceptance, their impact on research will continue to grow. They reduce the dilution of the impacts of PDS that comes about when impact studies are done on schools that are "paper" PDSs, where the name is changed but few or no PDS-like innovations are in place. Taken one step further, the standards may have another profound effect on assessing PDSs. The wider adoption and use of the standards over time will permit comparisons of the impact of PDSs that meet the standards with those school or college settings that do not (or with those that are in earlier stages of meeting the standards). Just as there are now research findings that compare National Board Certified Teachers in terms of their impact on student learning (Bonds, 2000), it is certainly easy to imagine the day comparable studies of PDS impacts make use of the standards. (In fact, an ongoing study organized by the National Educational Association is using a streamlined version of the standards to help evaluate and select sites for inclusion in a study of teacher quality and retention.) Because current reviews of the literature on the impacts of PDSs are limited by the lack of knowledge of whether the partnership in a particular research report is truly a PDS (see Teitel, 2001b, for a fuller discussion of this issue), an important long-term benefit of the standards may be their enabling such reviews to proceed.

The Climate of Increased Accountability

It is probably not a coincidence that in my first review of the impacts of PDSs (Teitel, 1996) and in my most recent (Teitel, 2001b), the most quantifiably impressive studies came from the state of Texas (Stallings, 1991; Houston, Hollis, Clay, Ligons, & Roff, 1999; respectively). Texas was an early adopter of frequent testing for students and for teachers, creating a data-rich environment for researchers. As other states follow, certainly other studies will draw on testing data, creating both an opportunity and a risk. The opportunity to draw on existing data (requiring little or no effort to develop instrumentation and collect and aggregate the data) adds important options for researchers, but poorly constructed tests or narrow-dimensioned examinations could become stand-ins for student learning or for teacher quality, or both.

The two Texas studies cited do not fall into this trap. Stallings (1991) drew on multiple measures, including student test scores as one of many indicators. Others included changes in classroom behavior of student teachers and cooperating teachers, as measured by trained raters on a previously validated classroom observation instrument. Follow-up interviews were done with student teachers; job placement data (to see whether the new teachers were more likely to work in urban districts, one of the stated goals of the PDS) were augmented by principals' rankings of how graduates were doing as 1st-year teachers.

Similarly, Houston et al. (1999) combined an observational methodology with other test data in a quasi-experimental model. Drawing on data from an urban consortium of four universities and three school districts, the study used several measures to contrast student teachers from PDSs with those from more traditional preparation programs. It compared scores on the Texas test for new teachers (106 consortium graduates had pass rates ranging from 92% to 100% compared to 781 nonconsortium graduates with pass rates ranging from 58% to 85%). In addition, researchers observed classes of a random sample of student teachers from each group (38 consortium, 34 non) to look at amounts of instructional time on task and a variety of other indicators associated with effective teaching. They found consortium teachers spent significantly more time responding to student signals, checking student work, encouraging self-management, praising student behavior and performance, and correcting student performance. In addition to the quantitative assessment of tests and observations, the authors provide a detailed description of the "treatment effects" of program (how PDS consortium programs differs from traditional preparation).

Drawing on the available data, Houston et al. (1999) went further to make a critical link rarely found in PDS research: connecting changes in teachers' preparation to impacts on the learning of their students. They again documented this both through observations (of, for instance, time on task) and through student gains on standardized test scores.

The availability and increasing sophistication of the test data will only grow. If care is taken to maintain a focus on a range of outcome measures and to look critically at the underlying tests and what they measure, this accountability climate has great potential to enhance impact research for PDSs and other partnerships. More districts and states will develop sophisticated assessments of teacher quality by looking, for instance, at the notion of "value added" by teachers. Sanders (1997) provides some compelling examples of this value, documenting the positive (and negative) impacts teachers have. At this point, most of the findings from these studies are reported in black-box style. We know that teachers in the top value-added quintile boost student achievement on test scores tremendously over those in the bottom quintile, but we do not really know why. The logical next step in this research is to look at how the approaches and the preparation of top-quintile teachers differ from those in the lowest segment, something Sanders reports he is undertaking (2001). One of the central questions in PDS impact research is whether preservice teachers prepared in a PDS are better than those from traditional programs, and the value-added data systems may provide some additional resources to find the answer. One of the partnerships in the National Education Association teacher-quality and -retention study is drawing on such data.

In sum, accountability data can provide useful measures for assessing the impacts of partnerships, but they cannot become all that matters.

A Conceptual Framework for Partnerships

The remainder of this chapter outlines a conceptual model that provides a research framework for showing how school-university partnerships can improve student learning (see Figure 1.2). It builds on the four-column model referred to earlier in this chapter, integrates the five key elements of PDSs from NCATE's PDS standards, and makes suggestions for drawing on a variety of accountability and other forms of data. The model is designed around PDS partnerships but should apply to any school-university partnership with a goal of focused outcomes for students (see Teitel, 2003, for further discussion of the framework).

The pyramid represents an alignment of the PDS standards with a focus on student learning. It places the standards in relationship to one another and sug-

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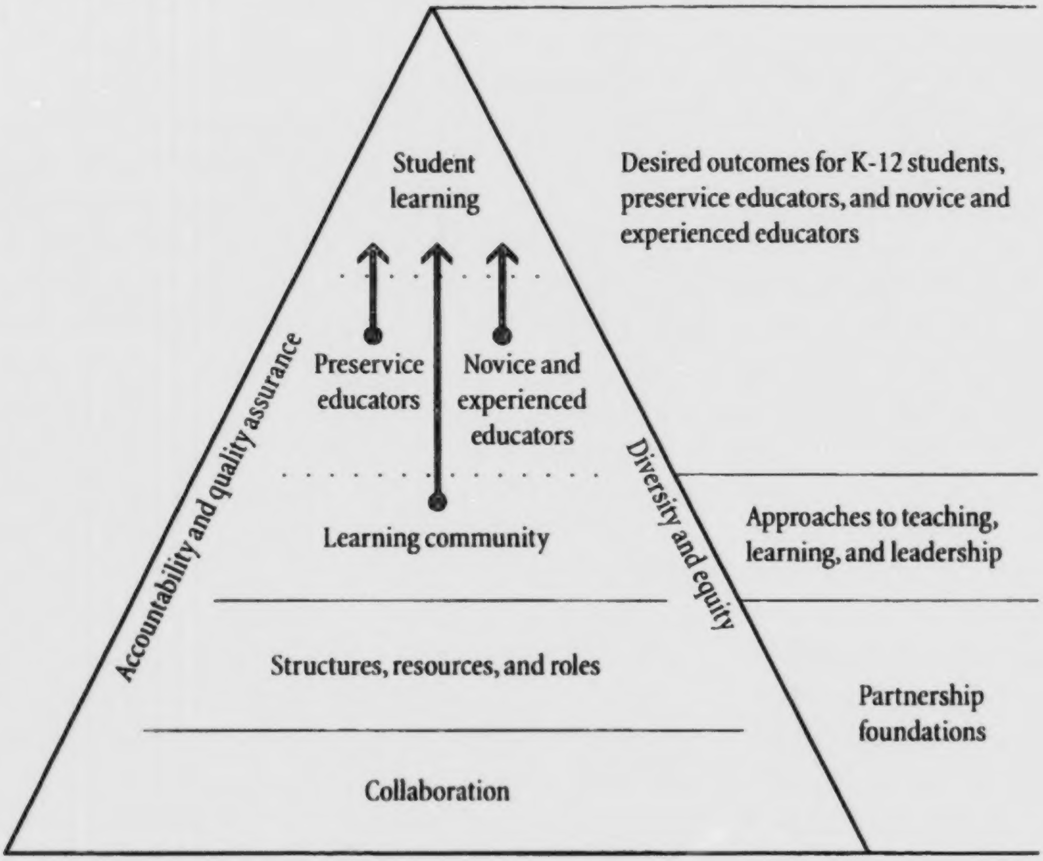
Figure 1.2. The PDS Standards-Student Learning Pyramid


Student learning
Desired outcomes for K-12 students, preservice educators, and novice and experienced educators
Preservice educators
Novice and experienced educators
Accountability and quality assurance
Diversity and equity
Learning community
Approaches to teaching, learning, and leadership
Structures, resources, and roles
Partnership foundations
Collaboration

Note. Adapted from Teitel (2003, p. xviii).

gests a vertical conceptual mapping, a logic model in which—starting from the bottom and working upward—

- Professional development schools are *collaborations* that set up new *structures, resources, and roles* to build and support stronger *learning communities.*
- Inside the PDS learning community, improved preparation of preservice educators, enhanced professional development for novice and experienced educators, and better learning experiences for K-12 students all lead to greater student learning.
- Attention to *diversity and equity* issues and the use of *accountability and quality assurance measures* to assess the processes and products of the PDS permeate all aspects of the partnerships and help maintain a focus on improved achievement for all students.

Although the pyramid builds from the bottom up (with collaboration and structures, resources, and roles providing a foundation for the learning community), changes come about in an iterative, recursive vertical motion. Changes in learning community (e.g., setting up a community service-learning program in which college students work with K-12 students on a community oral history project) may have implications and ripples at the foundational levels to support it. It may require new resources or changes in roles; furthermore, it might expand the collaboration by bringing in community agencies.

Even though it is far from a linear, one-way process, the pyramid shows how the standards can be linked to one another as part of a comprehensive documentation effort that is focusing on how the various facets of PDSs lead to improvement of student learning. Each standard is described below, along with the kinds of data that might be collected to provide a comprehensive, logical argument.

Collaboration

Partnership formation is the basic foundation for a PDS. For documenters, this category is the place to describe the school and university partners as well as, where applicable, families and communities, arts and sciences faculties, unions, and museums and other nonprofit organizations. In this section, documentation should include some background on partners and what brought them into the PDS, how it got initiated, and any key aspects of how it has grown.

Documentation of the extent and depth of the partnership would go here as well, including data on intern placement, involvement of university faculty in the PDS, involvement of school faculty at the university, and any other partners' roles. Other examples of data that could be collected to document collaboration include minutes of meetings, partnership agreements, histories, a calendar of partnership events, surveys of stakeholders, press clippings and copies of newsletters, and yearly progress reports (adapted from Sirotnik, 1988).

Structures, Roles, and Resources

To be effective, the partnership has to develop new roles, responsibilities, and decision-making processes as well as new organizational structures, resources, and resource allocation processes. This section is the place to describe how the collaborative is organized and the work supported. For example, included here would be descriptions of the governance council or steering committee, how joint decisions get made, and how the partnership is managed.

Types of data that would document this section include job descriptions and evidence of jointly conducted searches for personnel in new or modified jobs at the intersection of the institutions; evidence of boundary-crossing capacities; changes in reward structure (e.g., promotion and tenure language) at both institutions; operating budgets; schedules that show how time is used both at the school and at the college; and journal entries or reflections of participants.

Learning Community

At the heart of the partnership are the improvements in its learning community—the experiences of students and adults working together, focusing on improving student learning. Student learning is enhanced in at least three ways in a PDS partnership:

- Through better preparation of interns and their enhanced roles inside and outside the classroom with school students.
- Through professional development and other experiences of the faculty, staff, and administrators at the school and the college, engaging and focusing them on student learning.
- Directly for the K-12 students, through an improved learning environment—improvements in curriculum and instruction and enhanced relationships both in and out of class with interns, teachers, and other adults.

These strands are often intertwined and may include or lead to other learning community outcomes that have an impact on student learning, such as engagement with families and communities. (For example, a family literacy program or a program to engage community members as guest speakers or coteachers in a PDS may have positive and important impacts on student learning and influence each of the three major strands above.)

Data to be collected include syllabi and course sequencing (for K-12 students as well as preservice teachers), evidence of effective strategies for working with diverse students, professional development opportunities and plans for experienced educators, evidence of the beliefs underlying the practices, and documentation of what experienced teachers do with out-of-classroom time made possible by the presence of interns.

Data ideally would incorporate multiple measures—for example, to measure improved learning by preservice teachers, data might include perspectives from hiring principals, classroom observations from graduating teachers, and student test scores (Stallings, 1991); questionnaires on preservice teachers' preparedness drawing on views of preservice teachers, school-based mentors, and college faculty (Loving, Wiseman, Cooner, Sterbin, & Seidel, 1997); and archival data on graduates—where they applied to work, where they were hired, and what follow-up assessments of their preparedness and teaching skill over time show.

Because the learning community is the core of the partnership and is so critical for demonstrating impacts on student learning, several additional and more specific documentation examples may be useful.

To make the strongest linkages between learning community activities and desired outcomes, each of the three strands should be documented in two ways. The first part should identify and document the kinds of *experiences* PDS participants in that category are having (with an emphasis on what aspects of those experiences are unusual or particular to the PDS). The second part should iden-

Table 1.1. The Impact of PDS Experience on Interns

Interns are—	Supporting evidence	Impacts	Supporting evidence
• Fully experiencing range of what teachers do • Working with youths inside and outside of class	• Teaching or coteaching half a regular teacher's load • Meeting with parents regularly • Participating in all teacher and team meetings • Developing and running extracurricular clubs and events • Developing and offering elective courses • Connecting with youths through discussion groups, extra-help tutorial sessions *Sources:* • Brochure and outline of intern activities • Internship course syllabus, orientation, assignment calendar	• Realistic preparation • Content area knowledge • Teaching skills • Developing deep relationships with youths and strong commitment to urban schools • Sense of teaching in relationship to families and communities	• High-quality teaching performance (*evaluations by mentors, university staff, and hiring principals)* • Skilled curriculum developers *(curriculum product assessment)* • Intern attitudes to working with youths and families *(reflections by high school students, closing survey and exit interviews of interns, interns reflections, work products for on-site courses/seminars)* • Intern hiring and retention patterns

Note. Adapted from data courtesy of the Urban Teacher Training Collaborative, Boston (Teitel, 2003).

tify and document the *impacts* those experiences are having on the PDS participants.

Table 1.1 focuses on the better preparation of interns and their enhanced roles inside and outside the classroom with K-12 students. Note that the *Interns are* column (followed by its supporting evidence) represents the first part—what is new or different about the experiences participants are having in this learning community. The second part shows up in the *Impacts* column, followed by its supporting evidence. Table 1.2 shows a portion of an assessment, focusing on just two aspects of an intern's experience.

This portion of the documentation sets up a plausible link between the activities that interns are experiencing and the impacts they are reporting. Returning to the pyramid model, a thorough documentation should continue vertically, showing how these experiences for interns also have important impacts on K-12 students.

Using the same format, Table 1.2 demonstrates high school students' improved learning environment—better curriculum and instruction and enhanced relationships inside and outside class with interns, teachers, and other adults.

Table 1.2. The Impact of PDS Experience on High School Students

High school students have—	**Supporting evidence**	**Impact**	**Supporting evidence**
• More adults in the classroom • More availability of outside help • Increased number and variety of electives • Relationships with adults closer in age to them	• Intern hours served • Electives, extracurricular offerings • After-school help *Sources:* • Intern and student schedules • School schedules for electives and after-school tutoring	• More empowered • Greater academic skills • Less alienated • More connected • More accountable	• Attitudes of students to school and to interns • Frequency of coming for extra help, attendance *Sources:* • Administrator comments and attendance records • Reflective writing by students • Reflections by interns on exit interviews and for in-class writing • Performance assessments or test scores

Note. Adapted from data courtesy of the Urban Teacher Training Collaborative, Boston (Teitel, 2003).

Diversity and Equity

Each of the next two standards intersects with the others and, ultimately, with each other at the top of the pyramid (see Figure 1.2). Diversity and equity issues should cut through every aspect of the partnership:

- At the Collaboration level, documenters should focus on who is involved as partners and who is not. Is the partnership a dyadic relationship (between school and university), or are others involved—parents, community agencies, unions, etc. (see Murrell, 1998, 2001, for a fuller discussion of this issue)? What are the racial, ethnic, and cultural characteristics of the participating institutions, and what is their commitment to using the partnership to promote equity and social justice?
- At the Structures, Resources, and Roles level, documenters need to address how the organizational structures put into place create (or do not create) parity and reciprocity among the partners. Documentation should note the different roles taken by participants and how diverse and equitable those roles are (e.g., the pools of interns, mentors, and faculty) as well as how resources are used and issues of equity prioritized.

- In the Learning Community, key issues to examine include the philosophy undergirding the partnership and how it shapes curriculum, instruction, and assessment and the development of community among the teachers, interns, and students. How do issues of diversity and equity drive the content and process of the curriculum and instruction for K-12 students, interns, faculty, and administrators at all participating institutions? How are equitable opportunities to learn ensured for all participants?

At the apex of the pyramid, impacts on students become paramount. The intersection of diversity and equity with the assessment standard (angling up the other side) suggests the critical focus of documentation is on reduction of the achievement gap and evaluation of policies and practices to support equity.

Assessment: Research, Accountability, and Quality Assurance

The assessment standard also cuts through all stages and levels. Partnerships should include the following inquiry and assessment processes:

- At the Collaboration level, the partnership ensures accountability to its various stakeholders, including through maintaining accreditation of the participating institutions.
- At the Structures, Resources, and Roles level, the partnership uses assessment to reflect on and improve its own processes. This includes determining whether new roles are clear and people in them are supported and rewarded and whether partnership structures and use of resources effectively move the partnership toward its goals.
- At the Learning Community level, the partnership assesses the learning of all participants in ways that are useful for internal and external stakeholders. This means blending the use of external accountability measures with other forms of authentic assessment, using inquiry and action research as teaching and learning tools for students and adults, and connecting to professional accountability systems for adult learning.
- The partnership uses a variety of assessment techniques—including, but not limited to, high-stakes testing—to address student learning and achievement gap issues.

Conclusion

This reorganization of the five standards into a pyramid focusing on student learning outcomes provides a model that incorporates accountability data in a comprehensive conceptual framework. It may be particularly useful for those already familiar with NCATE's PDS standards by showing how standards work can and should be tied to assessment work. Finally, the pyramid helps to highlight the critical message captured in the title and woven throughout the pages of this book about the importance of ensuring that we keep making the links

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between partnerships and student-learning outcomes. With that in mind, I close with a cautionary note from Kimball, Swap, LaRosa, and Howick (1995):

> The means to effective partnership can easily become ends in themselves. For example, the energy for change in schools may become focused only on improving working conditions for teachers, establishing more collaborative decision making structures, or creating more flexible schedules, all of which can be means to the end of the learning but should not be ends in themselves. Administrative practice can change without passing the advantage to the classroom. (p. 24)

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COMPREHENSIVE SCHOOL REFORM EFFORTS

Making A Difference: A Professional Development School's Impact on Student Learning

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This study focuses on the impact of a Michigan professional development school (PDS) on student learning. While there are many ways to assess how a PDS affects student learning, including qualitative and quantitative approaches, this chapter confines itself to a longitudinal and comparative analysis of MEAP (Michigan Educational Assessment Program) test scores achieved by students of the Oakland University/Longfellow PDS in Pontiac, Michigan. It addresses several questions:

1. What was the status of MEAP student achievement prior to the formation and implementation of the Longfellow PDS?
2. Were there any significant gains in student achievement over time?
3. How did the PDS students' achievement rank in relation to other schools locally? Statewide?
4. If there were student learning gains, were the gains sustained over a significant period of time?
5. What were the relationships between PDS projects/activities and student learning?

The questions are shaped by a review of the research literature on PDSs, which documents that little, if any, attention has been given to the question of the effectiveness of PDSs in improving student learning (Book, 1996; Loving, Wiseman, Cooner, Sterbin, & Seidel, 1997; Teitel, 2000b; Valli, Cooper, & Frankes, 1997). The context for addressing the questions also emanates from an examination of the research, which reveals problematic issues regarding PDS definition and the assessment of PDS effectiveness.

The Research Problem: Definition and Effectiveness

PDSs have been promoted by a range of organizations: the Holmes Group (1986, 1990, 1995), the Carnegie Forum on Education and the Economy (1986), the National Network for Educational Renewal (Goodlad, 1994), the American Federation of Teachers (Levine, 1992), the National Education Association (Robinson & Darling-Hammond, 1994), and the Ford Foundation (Anderson, 1993). PDS models vary considerably, and there is extensive debate over just what is and what is not a PDS (Bradley, 1993; Holmes Group, 1995; Murray, 1993). Book in the *Handbook of Research on Teacher Education* (1996) summarizes the current definitional problem well:

> The operationalization of what is meant by a professional development school continues to plague researchers' ability to clearly explain what impact the activities of a PDS are having on teaching, learning, school organization, and teacher education. As researchers and teacher educators, we are often at a loss to define when a school is actually a professional development school. (p. 204)

Despite efforts to define and describe how a PDS might be evaluated (Sirotnik, 1988; Clark, 1995; Torres, 1992) and despite significant expenditure of energy and resources, there are very few studies on the effectiveness of PDSs. Goodlad (1994) muses, "Reports of success tend to be of a paradise envisioned, not gained" (p. 632). Published reports yield few data-driven conclusions; rather, anecdotal evidence is typically marshaled to support author claims (Teitel, 1996).

In a review of the research on PDSs, Valli et al. (1997) found that although the PDS advocacy literature emphasized changes in teaching and teacher education, by far the greatest focus of research (23 studies) had been on the development of collaborative relationships. A secondary focus had been on professional development (14 studies). Less systematic attention had been paid to teacher education (7 studies), the organization and structure of schools (6 studies), the nature of teaching and learning (4 studies), and the process of inquiry (3 studies). Moreover, they found that "although the mandate for PDSs stresses both changes in classroom teaching and improvements in student learning, research focuses almost exclusively on the former" (p. 260). In a large-scale, multisite study of the National Education Association's Teacher Education Initiative, which involves PDSs, Loving et al. (1997) found 10 organizational/structural changes, five changes in approaches to teaching and learning, and only one change in impact on student learning. In a review of PDS impact research, Teitel (2000b) found two studies (Stallings, 1991; Houston, Hollis, Clay, Ligons, & Roff, 1999) that reported gains in achievement test scores by students in PDSs. A third PDS study on student learning that showed significant gains in scores on a state achievement test was reported in 2000 by Knight, Wiseman, and Cooner. But there is almost no long-term comparative research on the impact of PDSs on student learning and achievement.

The implications of this glaring void in the PDS literature are clear. Abdal-Haqq (1998) critiques the lack of systematic attention to student achievement:

> This situation is disquieting for two reasons. First, if children are not significantly benefiting from the investment of time, effort, and resources devoted to PDSs, then both children and investors are being betrayed. . . . If, in fact, substantive work aimed at enhancing student learning is being done in PDS settings, positive results of this work can buttress arguments that continued investment in professional development schools is warranted. In addition, if PDS implementers are discovering or confirming productive practices and struc-

> tures, they have a moral obligation to disseminate their findings where the results can do the most good. (pp. 31-32)

Teitel (2000a) warns, "Without good documentation of impacts on preservice and experienced educators and on P-12 students, the professional development schools that have grown so fast in the last decade will wither away" (p. 1).

In responding to the limited amount of evidence regarding the impact of PDSs on student learning, this chapter presents test data demonstrating long-term and profound gains in student learning and achievement made by one PDS over a period of 10 years, from 1990 through 2000. Of particular interest is a comparative analysis of MEAP test scores documenting extraordinary student gains in learning. In addition, the various aspects of the Longfellow PDS including preservice teacher education, professional development, instructional and curriculum development, research, and educational restructuring initiatives are described. The chapter is organized around Teitel's (2000a, 2000b) conceptual framework for assessing PDS impacts, which "provides a logical, user-friendly way to link structural, cultural, and governance changes to new approaches to teaching and learning, and ultimately to desired outcomes" (2000a, p. 7). The conceptual framework uses a backward-mapping process to describe partnership development and to reflect changes in classroom and field placement experiences of student teachers; organizational, structural, and cultural changes; changes in teaching/learning practices; and desired outcomes (Teitel, 2000a, 2000b). The analysis of student outcome data reported in this chapter begins by addressing the definitional problem of PDS research.

Professional Development Schools: Moving Toward a Definition

The definitional problem is critical to assessing the effectiveness of PDSs. One view, which is helpful in moving to a useful, distinctive, and comprehensive definition, is offered by the Michigan Partnership for New Education (1992):

> While a PDS is a site for schooling, it is not representative of the typical school culture; while it is a site for teacher education, it is not representative of the typical university culture; while it is a site for scholarly inquiry, it is not representative of the typical research culture. It is a unique social and educational institution in its own right; it will develop its own culture distinct from traditions of either schools, teacher education institutions or research universities. The Professional Development School is not, therefore, merely a bridge between school and university; it is, instead, a new community of professionals and citizens committed to making education more effective and efficient to produce "higher order learning" for all children, youth and adults. (p. 2)

The perspective of the Michigan partnership reflects the inherent tensions and paradoxes embedded in a PDS and offers a contextual framework for operationally defining a PDS. Such a working definition was embraced by the Longfellow PDS, which defined a mature PDS as a community of partners, professionals, and citizens who have collaborated over time in the design, development, implementation, and evaluation of a school dedicated to the simultaneous improvement of education for all children and the professional preparation and development of educators through a broad K-16 agenda focusing on five areas:

- Organizational change and development
- Instructional and curriculum change and development
- Research and development
- Preservice teacher education
- Professional development for all partners

This PDS definition was operationalized and implemented over time through a recursive process of partnership development, structural change, and changes in teaching/learning activities and practices.

The Longfellow PDS: Partnership Development

Longfellow Community Elementary School is located in the city of Pontiac, Michigan. There are approximately 365 students enrolled in Grades K through 5. (Student enrollment has varied over 10 years with a maximum enrollment of 530 students in 1996-1997.) Seventy percent of the students are African American, 25% are White, and 5% are Hispanic, Asian, or American Indian. Seventy percent of the students are on a free-lunch program.

The instructional staff is composed of the principal, 15 classroom teachers, two learning resource center teachers, and three assistants. Part-time teachers include a librarian, a music teacher, and a physical education teacher. The racial composition of the instructional staff is about 60% White and 40% non-White. School district support staff include a secretary, a building engineer, a custodian, and six part-time employees (e.g., playground and cafeteria workers).

The Longfellow PDS was established during the 1990-1991 school year as a partnership among Longfellow Elementary School, the community of Pontiac, and Oakland University—a public, comprehensive, doctoral degree-granting university of more than 15,500 students that is located in Rochester, Michigan, adjacent to the city of Pontiac. The PDS was developed with the active involvement and representation of the Longfellow staff, the Pontiac Education Association, the Pontiac School Administrators Association, the Pontiac Chamber of Commerce, parents, the superintendent's office, and Oakland University administrators and faculty. The Longfellow Elementary School was selected from a pool of eight elementary schools in the Pontiac School District that had applied to become the first PDS with Oakland University under sponsorship of and funding from the Michigan Partnership for New Education.

In the initial stages of building the PDS, participants collaborated in writing a mission statement to guide and frame PDS activities. Over time, through discussion, reflection, and continuous assessment of PDS activities and outcomes, the mission statement was revised into a brief and clear statement of purpose: *Longfellow PDS has been established in partnership with Oakland University to maximize, in a rapidly changing world, the achievement and self-esteem of all members of the partnership.*

The PDS participants planned to accomplish this long-term mission by (a) providing quality learning for all students, (b) developing improved curriculum and innovative teaching strategies, (c) conducting action research, and (d) restructuring teacher education.

In the first 3 years of the evolution and development of the Longfellow PDS, participants confronted challenges in the areas of budgeting, team building, conflict resolution, collaboration, and consensus decision making. Subsequently, during the next few years, PDS staff began to examine and assess student achievement using results from the MEAP and the California Achievement Test as well as from teacher-generated assessments. Thereafter, the Longfellow PDS staff continued to focus on improving student performance in specific subject areas. The training of teachers through intern-mentor collaboration, continuing emphasis on team building and conflict resolution, ongoing examination and assessment of innovative and instructional strategies, and the integration of university methods courses in the school's program of curriculum and instruction provided a range of opportunities to improve the performance of both K-5 and Oakland University students.

As external funding for the Longfellow PDS phased out, it evolved into a "PDS academy" under the leadership of a new principal. The academy's mission is to invent an exemplary school designed to foster continuous school self-renewal, with a focus on excellence and equity for all students, and to support students' learning in an integrated way throughout all the years of their K-12 experience in Pontiac. For the 1999-2000 school year, the Longfellow PDS Academy listed among its "points of pride" a shared vision for a self-renewing school; high expectations for student learning; a continuing partnership with Oakland University; ongoing staff development; alignment of instruction with new MEAP standards; enrichment of instruction to bring students to grade level; a conflict resolution program; a parent center; community partnerships; a "school of arts" to enhance and provide experiences in drama, music, and dance; and literacy across the curriculum. The academy's mission and activities demonstrate that the concept of the PDS has been institutionalized and that partnerships with Oakland University and community agencies continue to move forward.

PDS Coordination, Planning, and Structural Changes

Planning for the implementation of the PDS began in spring 1991 and continued through the 1991-1992 school year. Initially, Longfellow experienced a number of growing pains as it moved toward becoming a PDS. Planning and governance were managed by a plethora of committees and subcommittees, which eventually became a concern for the staff. To better focus energy, time, and activities, the large number of governance committees was reduced to three: Coordinating Council (planning, coordination, decision-making processes, documentation); School Improvement Team (instruction and student learning); and Operations Review Committee (budget and logistics).

In the 3rd year of PDS implementation, 1993-1994, the Longfellow teachers and staff, with the approval of the Pontiac school district administration, restructured their workweeks to gain release time on Wednesday afternoons from 1:00 to 3:30 for planning and team meetings. They extended the remaining 4 teaching days by 30 minutes each in order to secure the 2½ hours of release time on Wednesday afternoons. Through collaboration with the Pontiac Boys and Girls Clubs, enrichment and recreational activities were offered to K-5 students when they were released early from school on Wednesdays. The Coordinating Council and School Improvement Team met on the 4th Wednesday of each month to prepare for staff meetings on the 1st Wednesday of each month. The 2nd and 3rd Wednesday afternoons consisted of ad hoc teams meetings and PDS staff collaborations. A core team of K-5 teachers and university representatives collaborated in discussing and developing innovative teaching strategies for both Longfellow and university students during these afternoon meetings. The restructured week resulted in improved communication among PDS participants, more coordinated instruction, and collaborative evaluation and assessment activities.

Support and assistance for coordination of all PDS meetings, the governance process, and budgeting issues were provided by a part-time Oakland University coordinator, a graduate assistant, and secretarial staff. The governance process was significantly enhanced when members of the Longfellow staff collaborated with the university's counseling interns to initiate conflict resolution workshops to improve staff communication, reduce tensions, and resolve conflicts among PDS participants. The staff development workshops not only enhanced collaborative team building and communication but also facilitated the continuing implementation of PDS projects and activities.

PDS Teaching/Learning Projects, Activities, and Practices

PDS projects and activities drew upon the strengths, needs, and priorities of the partners, addressing multiple goals formulated through discussion and planning by teachers, university faculty, parents, and administrators. Reading and mathematics were the instructional priorities for the school, clearly articulated by the principal and the district in staff meetings and school improvement planning documents. These priorities were strongly supported by parent groups. University initiatives centered on site-based teacher education (preservice, induction, and professional development), teacher research, and curriculum development. The projects and activities were implemented incrementally over time to ensure that the PDS was not overwhelmed by a surfeit of initiatives and that careful planning and deliberation would precede implementation.

Reading Recovery, a program developed in New Zealand, was introduced to the PDS during the 1992-1993 school year by a faculty member from the Oakland University Reading Department, who was director of the Reading Recovery program for the metropolitan Detroit area. He worked 4 mornings a week in the school with selected first-grade children who had been assessed as having low levels of reading skills and comprehension. The Reading Recovery program is an intensive one-on-one reading approach that systematically offers a variety of instructional and learning strategies based on the individual learning needs of each child. Complementing the Reading Recovery program, the Oakland University Reading Clinic was offered at Longfellow in the 1st year of the partnership with faculty and graduate students working with nearly 50 third-, fourth-, and fifth-grade students to improve their reading. In addition, a student "publishing center" was established and maintained by Oakland University teacher interns who facilitated children's writing through publication of their work in bound books created by the children.

Beginning School Mathematics (BSM), a K-3 mathematics curriculum resource developed by New Zealand teachers over a period of 12 years, was introduced to Longfellow teachers and parents in the 1993-1994 year by a senior member of the Oakland University early childhood program. The BSM resource places great stress on activity-centered learning through the use of more than 3,000 math manipulatives, active parental involvement in student learning, and reflective, flexible, and individualized leadership and responses by teachers, which encourage student investigation and inquiry.

The BSM program was complemented by a staff development program in mathematics for teachers of Grades 4 and 5 that consisted of before-school inservice sessions requested by PDS participants, individual consultation with teachers and interns, and demonstrations of small-group and whole-class mathematics instruction. In addition, 90-minute Family Math Fun Nights were conducted for parents three or four times a year with such themes as "Home Is the Heart of Math" and "Math Found Around the Home," encompassing topics dealing with calculators, metrics, place value, and Penthalon Math games.

A **parent involvement action committee (PIAC)** was formed in 1994-1995 as the result of a staff/parent assessment survey completed at the start of the school year with the support of the Michigan Partnership for New Education. The PIAC consisted of four parents, five teachers, the school secretary, the principal, and the Oakland University PDS coordinator. The committee divided into action teams based on six types of community involvement: parenting, communication, volunteering, learning at home, decision making, and community. PIAC activities included a "community walk" in which Longfellow staff, parents, and university students and faculty toured the neighborhood visiting various community agencies and getting a sense of the local culture and community; a "parent report card" that offered a way for students to talk with their parents about their needs and concerns; a parent reading tutorial program in which parents worked closely with teachers to provide reading tutorials at home and at school; and a partnership with St. Joseph Mercy Hospital for "Project Fit America" designed to enhance the physical health of K-5 students.

Thematic instruction. Beginning in the 1993-1994 year, under the leadership of a senior teacher education faculty member at Oakland University, the core curriculum was organized around schoolwide themes chosen by staff and students. Selected themes included rain forests, folk tales/heroes, habitats, human body, Olympics, and careers. Teams of Longfellow teachers shared theme information and collaborated on teaching strategies with university teacher education faculty, interns, and students. University students played a vital part in implementing thematic activities throughout the school. Each K-5 class participated in schoolwide assemblies in which the students demonstrated their understanding of core curriculum concepts using the themes. PDS funds were used to purchase additional supplies and curriculum materials and to support "real-life" learning experiences through various off-site field trips as well as classroom activities. Complementary support for thematic instruction also came through the formation of the Kaleidoscope Team, in which K-5 teachers and university faculty jointly planned teaching strategies and multigrade/multiage grouping of classroom activities to promote student learning. A subsequent qualitative evaluation of the Longfellow PDS, conducted with a focus group of nine teachers and the principal (Michigan Partnership for New Education, 1996), indicated that the group believed the Holmes Group's PDS principles came to fruition through planning and implementation of thematic instruction.

A **community health services program** was launched during the 1995-1996 school year with the placement in the PDS of 20 community health nursing students from the Oakland University School of Nursing. Their presence and collaboration with the teacher interns helped to enhance Longfellow staff efforts to address community health-related needs for selected K-5 students and their families. The nursing students conducted 1,600 hours of community health services, including 40 home visits to selected Longfellow families, team-teaching projects with Longfellow teachers on matters of health and fitness, and collaboration with 10 Pontiac community service agencies.

Inquiry and action research projects became one of the primary foci of the PDS from the very beginning. Members of the PDS were provided time to participate in action research studies to ensure that effective teaching practices were developed and implemented to maximize student achievement. The research centered primarily on the evaluation and assessment of partnership activities relating to the improvement of student achievement. Many Longfellow teachers were involved in informal collaborative action research with university interns and faculty in their classrooms, trying out and demonstrating various innovative instructional strategies using current research, reflection, and inquiry. Some more formal research projects conducted at the PDS by teacher research teams focused on student-led conferences and portfolio development, math attitudes and journals, Beginning School Mathematics for kindergartners, and teacher incentives for professional development. PDS teachers, interns, university faculty, parents, and community volunteers shared their reflections and inquiry through presentations given at national, state, and regional conferences on a variety of topics.

Site-based teacher education consisted of a yearlong internship, involving 6 to 10 interns each year, and four education methods courses offered at the PDS, involving approximately 120 students who collaborated with PDS teachers in planning and implementing activities to reinforce thematic teaching. In addition, Longfellow student achievement goals and activities were integrated into the coursework requirements for students in the methods courses and for the teacher interns who were placed at the school. The impact of bringing together teaching interns, preservice students, university teaching faculty, classroom teachers, the school principal, and school support staff to collaborate on common goals for K-5 students was significant in advancing the opportunities for quality student learning and in enhancing the quality of the Oakland University teacher preparation program.

The **counseling internship program** consisted of the presence of two or three counseling interns who provided students with intervention and prevention services and activities in behavior and self-esteem. In addition, the interns offered conflict resolution workshops to Longfellow teachers and students, coordinated a schoolwide conflict management program, and worked closely with local community agencies and nursing students in making appropriate interventions with children with serious behavioral and emotional problems.

Continuous evaluation and assessment of PDS goals was accomplished through analysis and discussion of standardized tests, parent and student surveys, student portfolios, anecdotal records, and action research studies. Evaluation and assessment were guided by one driving question: *Are school improvement and PDS activities making a difference for Longfellow student learning?* The analysis of data, records, and reports was a collaborative effort involving teachers, university students, and faculty who shared their work in team meetings and—through conversation, reflection, and inquiry—developed strategies to address student learning needs.

Student Outcomes: A Comparative Analysis

Longfellow PDS students achieved significant gains in achievement over time as measured by the MEAP tests. Their scores exceeded those achieved by elementary students in the Pontiac Schools, in Michigan schools (including all elementary PDSs), and in one of the wealthiest school districts in the country—Bloomfield Hills.

The MEAP is based on state academic standards in reading, writing, science, and math. "Cut" scores are determined that allow students' performance to be divided into categories of proficiency: For the fourth-grade reading and mathematics tests, the categories are Satisfactory, Moderate, and Low; for the fifth-grade science tests, the categories are Proficient, Novice, and Not Yet Novice; and for the fifth-grade writing tests, the categories are Proficient and Not Yet Proficient. The scores reported in this study are percentages of students who achieved in the top category in each subject (Satisfactory or Proficient).

In the 1st year of the implementation of the Longfellow PDS, 25.6% of fourth graders scored at or above Satisfactory in mathematics; in reading, 36.3% scored Satisfactory. In the 2nd year of implementation, the MEAP math and reading scores fell, with a sharp decline in reading and a modest decline in math. The drop in scores seems to be a classic example of the "implementation dip" (Fullan, 1991) characterized by lower student achievement in the first 2 or 3 years of a school change effort caused by so much staff energy and time being deflected by the requirements and demands of structural, organizational, and cultural change.

From the 1st year of PDS implementation score of 25.6%, math scores climbed to 92.1% in 1995, declined somewhat in 1996 and held steady over the next 2 years, then surged to 97.8% in 1999 and to an astonishing 100% in 2000—meaning that all fourth-grade students scored Satisfactory in that year (see Figure 2.1). Reading scores also climbed significantly by 1995 and finished 2000 with 82.9% Satisfactory (see Figure 2.2).

Researchers have found (Bryck, Sebring, Kerbow, Rollow, & Easton, 1998; Hoff, 2000) that test scores follow a predictable pattern, starting low, rising quickly for a few years, leveling off for a few more, then gradually dropping over time. While experiencing some modest declines, since 1995 Longfellow scores have been sustained at or above levels of 80.3% Satisfactory in mathematics and 70.0% in reading, representing extraordinary gains from the low base scores achieved in the 1st year of PDS implementation. The math scores of 97.8% in 1999 and 100% in 2000 clearly represent more than sustainability. It remains to be seen how Longfellow test scores will be sustained over the next several years, but there can be no doubt that the math and reading scores represent dramatic changes in achievement over 10 years and exceed the MEAP scores for schools in Pontiac and the state of Michigan.

Comparisons were also made with districtwide MEAP elementary math and reading scores in Bloomfield Hills, one of America's most affluent communities (Nguyen, 2000), located contiguous to the city of Pontiac. From 1995 through 1998, Longfellow MEAP scores in mathematics ranged 3 to 13 percentage points lower than Bloomfield Hills. In 1999 and 2000, the Longfellow math scores exceeded those of its neighboring school district. Reading scores at Longfellow surpassed Bloomfield Hills in 1995, 1996, and 1997, then fell be-

Figure 2.1. Grade 4 Scores on MEAP—Math

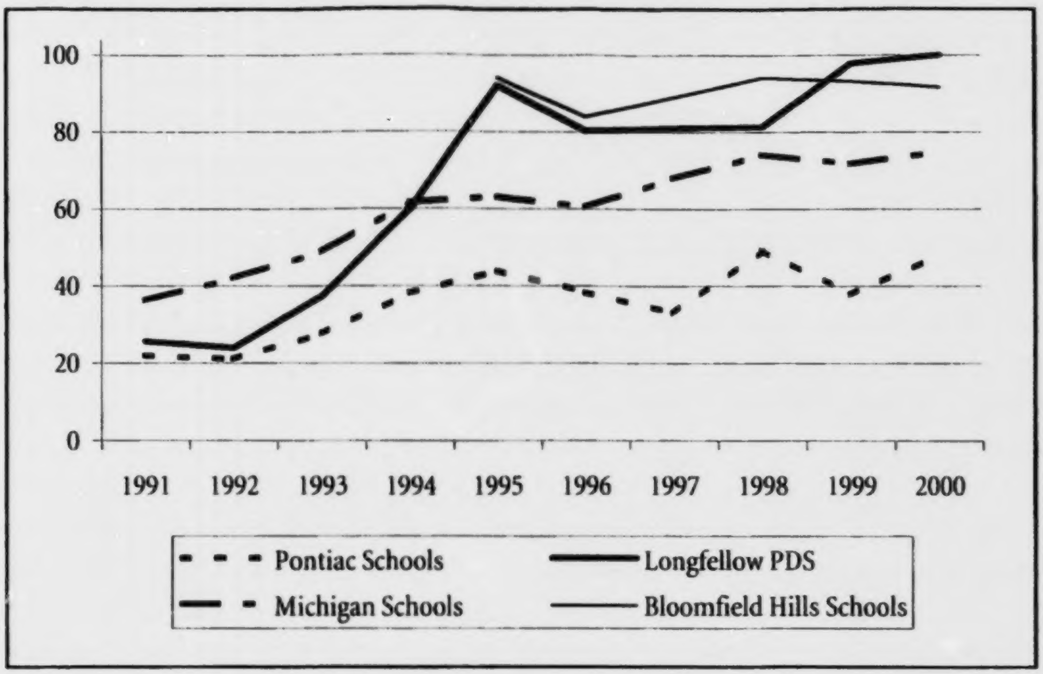


Figure 2.2. Grade 4 Scores on MEAP—Reading

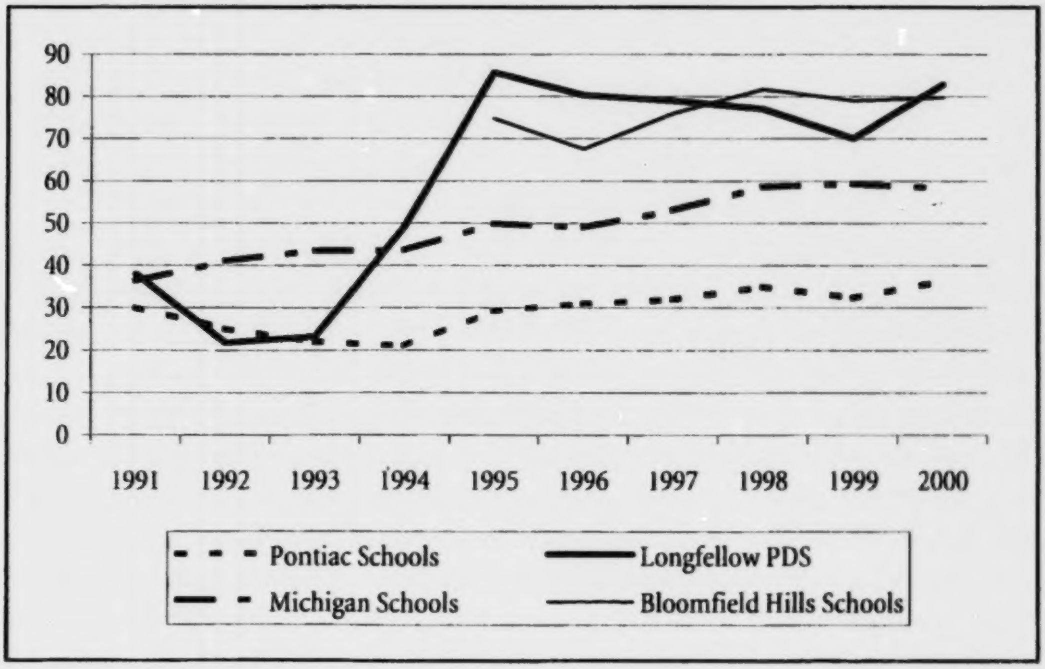


Figure 2.3. Grade 5 Scores on MEAP—Science

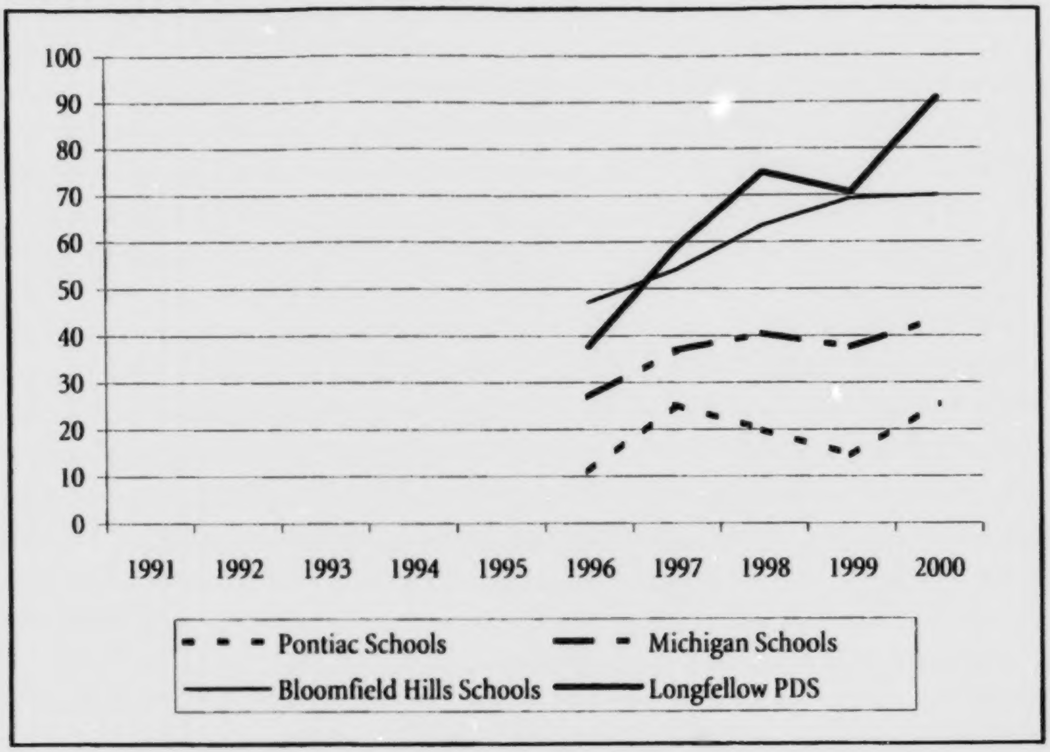
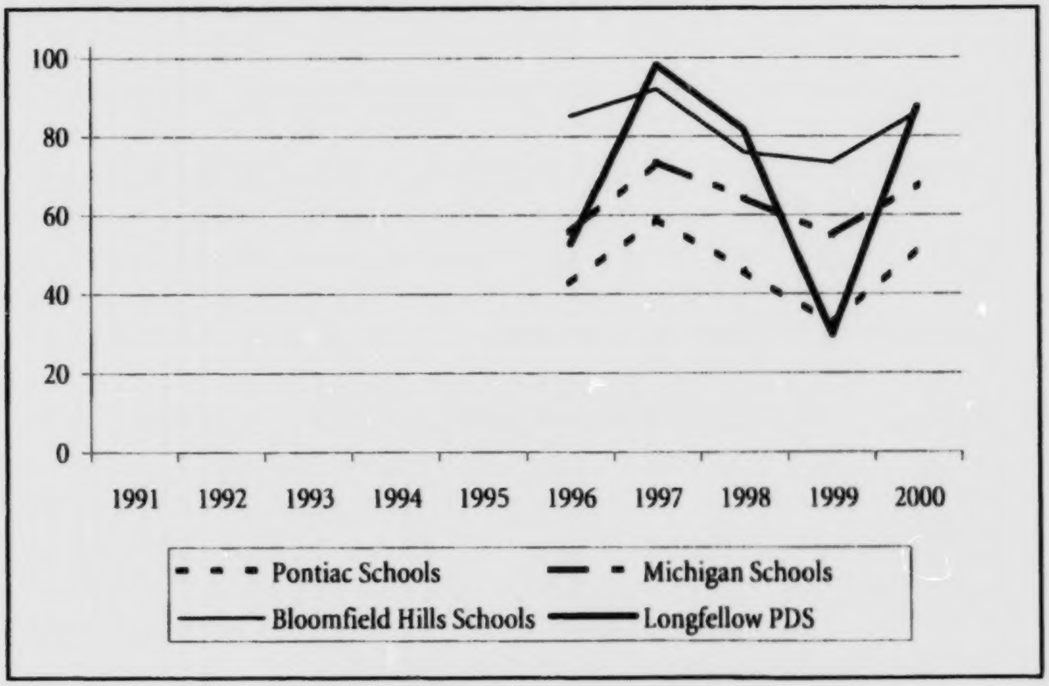


Figure 2.4. Grade 5 Scores on MEAP—Writing



hind for 2 years before rising again in 2000 to 82.9%, exceeding the Bloomfield Hills score of 79.8%.

In 1996, the state of Michigan instituted MEAP assessments at the fifth-grade level in the areas of science and writing. From 1996 through 2000, a comparative analysis of MEAP science scores shows Longfellow scores climbing and exceeding test scores for the Pontiac School District, Michigan, and Bloomfield Hills (see Figure 2.3). The Longfellow science score in 1996 was 37.7% Proficient and rose over the next 4 years to 90.9%. The Longfellow writing score on the MEAP in 1996 was 52.7% Proficient and rose to 87.5% in 2000 (see Figure 2.4). In both fifth-grade subject area MEAP tests, Longfellow scores in 2000 surpassed the Grade 5 scores of the Pontiac School District, Bloomfield Hills, and the state.

Accounting for Scoring Gains

What accounts for the significant gains in the MEAP made by the fourth- and fifth-grade students in the Longfellow School? Clearly teacher dedication and commitment to long-term change made a significant difference; educational reform cannot occur unless it is embraced by classroom teachers. Throughout the life of the PDS, Longfellow teachers constantly sought to improve their practice and to seek new knowledge and expertise from a variety of sources to improve teaching and learning in the school. They actively participated in thoughtful, open, and sometimes painful discussions and debates, among themselves and with university faculty, about improving student learning. They were passionate about their work and their belief that every student could learn. They were risk takers who spent endless hours of time in implementing new initiatives. Without the energetic support of Longfellow teachers for educational change, professional development, and a series of new program initiatives, it seems unlikely that the scoring gains achieved by Longfellow students would have happened.

Parallel to the commitment of the school's teaching staff, the active involvement of university faculty in the PDS warrants attention. At one time or another during the development and implementation of the PDS, eight university faculty members—six senior, tenured faculty and two nontenured faculty—were engaged in providing collaborative leadership and support for instructional and curriculum initiatives in reading, mathematics, thematic instruction, counseling, action research, and supervision of teaching interns. In addition, several faculty participated in PDS governance with classroom teachers and school administrators through a variety of school- and districtwide venues. The continuing deployment of a number of university faculty in the PDS over time has to be considered a significant contribution, indirect or direct, in speculating about the factors influencing instruction and student learning.

What were the possible cause-and-effect relationships between specific PDS activities and projects and the extraordinary gains made in test scores from 1990 through 2000? It is difficult to sort out the relationships between each PDS initiative and gains in specific MEAP scores. A strong case could be made that the Beginning School Mathematics program, with its strong emphasis on a constructivist learning approach, teacher leadership and initiative, and parent involvement along with other related and complementary math activities, accounted for the gains in math scores. It could be argued that because the BSM program was implemented for K-3 students, it would have its greatest impact on Grade 4 students who took the MEAP tests in the year following their transition from third grade. Along the same lines, one could hypothesize that the Reading Recovery program, other reading projects, and the clear, schoolwide focus on reading and literacy accounted directly for the gains in reading.

On the other hand, the combination and interaction of many significant resources and program activities concentrated in one school could account for the test gains collectively by creating a culture of teacher and school change, developing a supportive climate for instruction and learning, and integrating the delivery of instructional, human, and community services to ameliorate psychological and social issues that impede learning. Many teachers felt that the thematic instruction made a significant difference in bringing coherence to PDS activities, in achieving the full implementation of Holmes Group principles, and in integrating instruction across the curriculum.

Teacher and principal leadership coupled with professional development is also a significant variable to consider. Throughout the life of the Longfellow PDS, a core group of senior, veteran teachers working with the complementary support of two strong principals provided energetic and sustained leadership in developing and supporting instructional and curriculum change and in maintaining the focus of the PDS on student learning.

Although I believe that one or a combination of these explanations may account for the substantial gains made over 10 years, an analysis of PDS documents (planning documents, school improvement plans, mission statement, newsletters, annual reports, correspondence, minutes of various meetings, and action research studies) suggests another possibility. Running through the PDS documentation is an overriding concern for student learning. Throughout all the PDS projects and activities teachers, interns, university faculty, parents, and administrators consistently focused on student learning and achievement. Looking collaboratively at student work over time is a powerful strategy to inform and change teaching practice and curriculum (Allen, 1995, 1998; Barr, 1995; Blythe, 1999; Buchovecky, 1996; Feiman-Nemser & Rosaen, 1997; Newmann et al., 1996; Seidel, 1996)—and MEAP and other standardized test scores, student portfolios, samples of student work, parent and student surveys, and action research studies were analyzed and discussed by the partners and used as a base for improving instruction. Concern for student learning permeated the on-site teacher education program and the meetings of the PDS coordinating council and the school improvement team. The mission statement clearly articulated a strong commitment to student achievement. Parental engagement centered on tutorial programs and at-home support and instruction in reading and mathematics.

One of the distinguishing features of the PDS was the sustained, continuous program of assessment and evaluation guided by unequivocal commitment to making a difference in student learning. While not discounting the significance of the other relationships previously mentioned, this clear, compelling PDS commitment and the actions driven by this commitment seem to have been powerful forces in affecting Longfellow student learning as measured by gains in the MEAP reading, writing, mathematics, and science test scores. It is evident that the focus and emphasis on student learning created a rich climate for PDS instructional and curriculum projects, initiatives, and changes to take hold.

Schmoker (2000) quotes Asa Hilliard's perspective on the relationship between schools' emphasis and their students' test scores:

> All standardized tests have their place, even the weak ones. Without them we would have nothing—no way to hold people academically accountable for teaching and learning. But we need to look at the schools that are doing well on the standardized tests and realize that these schools are focusing on the curriculum *and* on the students. (p. 62)

While this study addresses the impact of a PDS on student learning, it also speaks to the national concern regarding the persistent achievement gap between relatively advantaged White students and poor students and students of color (Viadero, 2000a, 2000b; Viadero & Johnston, 2000; Weissglass, 2001). The record of the Longfellow PDS in significantly raising the MEAP test scores of a primarily African American school population in a low-income neighborhood is a significant accomplishment—the importance of which may be best understood in light of a comprehensive study of Michigan's public schools in the recent Standard & Poor's report, "Statewide Insights" (Olson, 2002). The report is based on an analysis of 100 million pieces of district-by-district information, ranging from test scores to spending patterns to per-capita income for the school years 1996-1997 through 1998-1999. In 1999, 59.9% of White, non-Hispanic students met state standards on the MEAP, compared with 31% of Black students, 36.8% of Hispanic students, and 33.2% of Native American students. Forty percent of students from poor families met state standards, compared with 56.2% of students from wealthy families. Given this data context, the remarkable achievement of the Longfellow PDS in dramatically raising the scores of historically low-achieving students calls for a more in-depth analysis of the factors that affected test performance. Such an analysis is important in informing our understanding about ways in which the achievement gap can be closed so that the learning potential of all children can be realized.

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CHAPTER 3

Expanding the Potential of School-University Collaboration: Special and General Education as Partners in Improving Student Achievement in a Rural Professional Development School

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In this chapter, we chronicle two universities' efforts over 4 years in supporting a rural district attempting to redefine itself as a model site for preparing teachers. The district's experience illustrates a renewal opportunity for faculty that has led to quantitative and qualitative changes in students' achievement and teachers' learning, dispositions, and performance.

Theoretical Framework

Four theoretical literature bases informed the project: (a) sociocultural and discourse theory (Gee, 1996; Vygotsky, 1978; Wertsch, 1991; Wells, 1996), (b) educational change (Fullan, 1991; Hargreaves, 1994; Sergiovanni, 1994; Sparks, 1998), (c) professional development schools (Darling-Hammond, 1997; Holmes Group, 1990, 1995; Valli, Cooper, & Frankes, 1997), and (d) teacher-researcher communities (Cochran-Smith & Lytle, 1993; Englert, Raphael, & Mariage, 1998). Sociocultural theory was particularly important in shaping our beliefs, especially the role that activity settings (i.e., collaborative structures) might play in affecting both first- and second-order changes (Cuban, 1988) and how these structures might animate one another to create new forms of discourse (Gee, 1996), values, norms, ways of knowing, and behaving (Santa Barbara Discourse Group, 1992). A second underlying premise was that teachers have their own "zones of proximal development" and that if we were to effect change beyond small pockets of voluntary participants, there must be multiple entry points for all faculty, staff, and administration to grow professionally. Third, there must be a longitudinal perspective that allows for the entire apprenticeship cycle to occur, including having teachers make public their learning to external audiences (e.g., other colleagues, interns, board of education, conferences). Fourth, as various collaborative structures became institutionalized as part of the school culture, there was a greater assurance that the new school culture could reflect the undergirding goals of educational change and PDSs. These included the need to create an underlying collaborative culture and ethic (Hargreaves, 1994); establish a professional disposition toward continuous improvement and building the capacity of the school and community (Fullan, 1991; Hargreaves, 1994; Sergiovanni, 1994); make data matter in most decisions (i.e., disciplined inquiry; Sparks & Hirsch, 1997); and build inclusive learning communities in which research-based teaching and inquiry-based teaching in a balanced curriculum are afforded each student.

The members of our school-university partnership felt that there needed to be mechanisms to create both formal and informal discourse spaces. Discourse spaces were designed to meet the unique needs of the district's emerging vision and the professional needs and identities of individuals, while also renorming the culture of our schools in powerful ways. Pugach and Johnson (1995) remind us that simply having a variety of collaborative structures does not equate to creating a collaborative culture, an "evolutionary relationship of openness, trust, and support among teachers where they define and develop their own purposes as a community" (Hargreaves & Dawe, 1990, p. 227).

The purpose of this study was to examine the impact of our systemic reform efforts on student achievement and the ways in which the partnership helped develop a collaborative infrastructure and learning culture for all stakeholders in our two school buildings. Particular attention was paid to how expertise developed in the field of special education could support the reform efforts being undertaken by the schools and could also serve to create an enhanced site for extending the professional preparation of intern and inservice teachers. In this paper, we examine three research questions:

1. Have there been measurable changes in student achievement on multiple measures since the inception of the school-university partnership?
2. How have the various collaborative structures in the project worked together to support teachers' professional development?
3. Are there specific examples of how the partnership has directly effected changes in teaching performance that have led to changes in student achievement?

Partnership Site Description

The site for this study was a Grades K-2 (primary) and a Grades 3-5 (elementary) school in a diverse, rural setting serving 750 students and staffed by two principals, 38 faculty, 20 paraprofessionals, and three special education teachers. Two universities and one intermediate school district were included in the development of the collaborative site. Scores from the Michigan Education Assessment Program (MEAP) indicated that the district was the lowest achieving of the 37 school districts in southwestern Michigan, with all four content area scores for fourth- and fifth-graders ranking last. During the initial year of the project, only 17.8% and 25% of fourth-grade students successfully passed the reading and mathematics sections of the state assessment, respectively. This contrasted with state average of 49.0% and 60.5%. Similarly, only 16.2% and 44%

of the fifth-grade students passed the MEAP in the areas of writing and science, respectively, in the initial year of the project, compared to state averages of 36.8% and 73.4%. The district's income levels were among the lowest in the state of Michigan; 63-70% of the students received free or reduced-price lunch. The district is a Title I school and uses federal funds to support a variety of instructional programming. There is also some racial diversity, with 15% African American and 15% Hispanic students. These two groups of students regularly score below their White peers in measures of reading and writing. In addition, the county surrounding the town has the highest per-capita migrant population in the state of Michigan.

Our needs analysis, planning, and participant observation work in Year 1 revealed the following situation:

1. No common curriculum in any subject except a new direct-instruction reading program (begun the year our project started) across Grades K-5.
2. No curriculum standards or outcomes for any subject in any grade level.
3. No assessments being tracked by the district other than the MEAP, and its data were not being used to inform changes in teaching practices.
4. Few collaborative structures for faculty to participate in and only fragmented professional development opportunities.
5. Low parent participation.
6. An existing culture in several of the buildings that overtly and covertly seemed to resist change and discourage instructional risk-taking.
7. Few partnerships with any community agency or with the local university.
8. No shared vision for change at either the primary or the elementary level.

Developing a Collaborative Infrastructure to Support Teacher Learning

Project PREPARE, as we called our collaboration, was a part of a state-initiated project funded by the Office of Special Education and Early Intervention Services called Collaborative Sites of Practice and Inquiry. Recognizing the enormous complexity involved in educational change with a school-university-district partnership, the state wrote the original request for proposals with the following guidelines. First, Year 1 of the project would be devoted to establishing the collaborative site, including the development of milestones, goals, and outcomes for the subsequent implementation. Next, membership on the planning committee in Year 1 must include representatives from the school district, teacher union, building administrators, and parents. Third, members of the collaborative site must involve a local education agency, institution of higher education, and independent school district (ISD), including an agreement to commit to a 10% match in funds. Finally, the goals of the project were to unify aspects of teacher preparation between special and general education, focus on improved educational outcomes for students, and develop a system for continuous improvement.

The purpose of the partnership included the following:

- To develop and pilot a collaborative model for creating, implementing, evaluating, and sustaining educational change.
- To develop a sustainable model of professional decision making that unifies aspects of general and special education candidates' professional preparation.
- To provide a professional renewal and development experience for project participants, including teachers, faculty, administrators, and ancillary support personnel.
- To examine the effects of the action research projects on student achievement.
- To study and examine the effects of the change process on the learning of both special education and regular education students, preservice intern teachers (both general and special education), and participating faculty members.

Year 1 of the study was devoted to planning and introducing a teacher study group at both buildings. The primary working group of Project PREPARE was the planning committee, a group made up of the superintendent, building principals, the reading specialist, and a classroom teacher, that met on a monthly basis. An advisory board provided oversight to the project. Years 2 through 4 were devoted to implementation, refinement, dissemination, and evaluation of each of eight collaborative structures that emerged throughout the study.

The eight collaborative structures were developed to address the larger goals of the project and included a consulting relationship to the North Central Outcomes Accreditation/School Improvement teams; grade-level intervention assistance teams; teacher study groups (i.e., action research projects); summer school; home-school partnerships; mentor/intern teacher program; mentor/mentee program; and a professional development center in each building. The first two of these structures were mandated contractually by the district. The remaining six structures were not mandated by the district but rather had their conceptual origins in Project PREPARE. The following sections provide a brief description of each mandatory and voluntary collaborative structure.

North Central Outcomes Accreditation/School Improvement Process

The district agreed to undertake a 5-year cycle of improvement through participation in the North Central Outcomes Accreditation/School Improvement process. This process required each building to conduct its own needs analysis, select target areas for developing improvement plans, allow faculty and other stakeholders to join one of the target teams, and meet on a monthly or bimonthly basis throughout the year to develop goals, objectives, and implementation plans.

In Year 1 of the project, three target areas emerged from both the primary and the elementary building, including reading, mathematics, and social responsibility. Each group, consisting of five to seven faculty members and several other stakeholders (e.g., counselor, paraprofessionals, researchers), met to develop its improvement plans. This mandatory collaborative structure developed by the district provided a critical site for initial conversations about developing a new vision for the school and afforded researchers an entry point into the discussions that would ultimately frame what was expected of students at each grade level in the various content areas.

Grade-Level Intervention Assistance Teams

A second mandatory collaborative structure was the creation of a new schedule to provide a daily 50-minute planning time for each grade level and to accommodate the development of grade-level intervention assistance teams on a biweekly basis. Focus groups conducted with each individual grade-level team indicated great frustration with students who presented significant learning or behavioral challenges. Although there was a "child study team" that served the two buildings, this team was used primarily to determine whether a referral to special education was warranted rather than as a collaborative problem-solving team to provide general education teachers with concrete strategies and ideas. We felt that this situation presented an opportunity to build the capacity of all members of the grade level and their intern teachers. Previously, the problem identifier typically worked with a team made up largely of specialists who often had a very different frame of reference (i.e., individually oriented vs. group oriented) for understanding academic and behavioral challenges (Friend & Cook, 2000). As evidence of the need for a more supportive intervention assistance process, less than 20% of the 36 students across Grades K-5 who were referred for special education in Year 1 of the project eventually qualified. In Year 4 of the project, only six students were referred for special education, with four of the six qualifying.

The two mandatory collaborative structures were critical in establishing continuity in the curriculum, a shared vision and direction for faculty, and a sense of community within and across the grade level teams. Both the target area teams and the grade-level intervention assistance teams provided collaborative spaces to develop new roles (e.g., leader of target teams, problem identifier, brainstormer, facilitator), new participation structures, and new sets of knowledge (e.g., core standards, "Learner will ..." statements, instruction adaptations, behavioral interventions). The focus on continuity in instruction helped establish the conditions for being more sensitive to student outcomes and using achievement data to impact decision making. In this way, personal accountability to teaching was heightened, and student outcomes served as a starting point for discussing the adoption of new curricula and the professional development necessary for implementing the curricula.

Teacher Study Groups

The first voluntary structure to be established was a teacher study group at both the primary and the elementary building facilitated by the two authors and project codirectors. A $500 stipend to support each participant's project was provided by the district's matching-fund requirement of the grant. Goals for the study group were to facilitate faculty and their intern teachers in a study of their teaching, to create a new community of practice that supported teacher learning, to support instructional risk-taking, to serve as a source of new knowledge that could inform the curriculum alignment and implementation process, and to create our own stories of success.

Model Summer School Program

During the planning year, project directors initiated the idea of implementing a summer school program to draw on the resources and practicum/internship needs of graduate students who were completing their initial endorsement in special education. The goals for the summer program were to (a) accelerate and sustain learning by engaging students in at least 2 hours of balanced literacy instruction and 1 hour of math instruction each day; (b) provide all faculty the opportunity to participate in 1 week of professional development preceding each summer school session; (c) extend the school year by 7 weeks (35 days) for students in prekindergarten through Grade 8; (d) target the lowest-achieving third of students with special invitations to participate; (e) provide teachers an innovative collaborative teaching team that included a faculty member, a graduate student in special education, and a paraprofessional; and (f) include an abbreviated 3-week program for gifted and talented students, with the option to continue in the regular summer program.

Home-School Partnerships

A third voluntary facet emphasized the central importance of connecting with the home and community as partners in the education of children. As in many low-achieving schools, there were large segments of our parent population who viewed schools and schooling from a distance. While parents may indeed have been interested in participating in their children's education, we were ineffective in supporting efforts to engage and involve parents in ways that were comfortable for the parent. Even when supports were arranged, such as providing transportation to and from school to attend parenting classes given by our school counselors, parents initially signed up but then chose not to attend. Fourth- and fifth-grade students produced low achievement in all five content area subjects of the state-mandated MEAP test, while our middle schools scored higher than several other districts, suggesting that we may be getting off to a slow start. To date, the district has taken several important steps in bridging the home-school gap and making our schools more consumer friendly and accessible for our families during the school year and in the summer months.

Mentor/Intern Program

In addition to providing a renewal experience for faculty and improving student achievement, a primary purpose for creating a collaborative site of practice and inquiry was to enable the school district to be in a position to prepare tomorrow's teachers. The university had extensive expertise in working with professional development and collaborating schools, including a highly evolved school-university partnership team program. In this structure, a university faculty member serves as a liaison to the building and partners with a mentor coach, usually a teacher or administrator in a school or district, to codevelop and implement weekly mentor teacher and intern teacher seminars. All of the mentor coaches also attend monthly half-day professional development workshops with their university liaisons and share the information they learn (e.g., mentoring, cognitive coaching, performance assessment, constructivist principles of practice) at their weekly seminars with both mentors and interns.

Project PREPARE had the additional goal of creating a "model" site for the preparation of general education interns around issues of teaching students with special needs. Therefore, in our site we provided additional opportunities for interns to learn about working with students with special needs, including involving interns in the biweekly grade-level intervention assistance team meetings, job-shadowing a special education teacher, and attending "Special Education Day" at the intermediate school district.

Mentor/Mentee Program

The fifth structure supported and partially conceptualized by Project PREPARE in Year 3 was a request by the district that we help develop a mentor/mentee program as part of a state requirement for providing mentorship to untenured teachers during their first 4 years of service. A project codirector, the primary building principal, and an outside expert formulated, introduced, and launched the new program. The mentor/mentee program supported the core principles of our project, especially the ongoing professional development of teachers. We believed that over time, supportive structures might impact another key challenge to rural districts: recruitment and retention of highly qualified faculty.

Professional Development Center

The final and most recent voluntary structure in Project PREPARE was a professional development center (PDC) created in both the primary and the elementary buildings in order to bring professional resources from around the world to a rural school district, create a technology infrastructure in the district, and provide faculty opportunities to use technology in their own teaching. The PDC included computers with Internet access and a videotape and professional resource library. The computer laboratory also provided the only Internet access labs in the K-5 buildings and housed the accelerated reader tests for the schoolwide reading program.

Project Evaluation

We treated each of the eight collaborative structures as semi-independent research studies, but we were equally interested in trying to understand the synergistic effects of the entire project. For each collaborative structure, we developed a series of research questions, methodological tools, and research designs. Additionally, a major outcome for the project was to implement and evaluate a wide range of student achievement measures. Several of these measures were curriculum based (e.g., pre/post reading levels; pre/post mathematics grade-level tests); others were implemented on a schoolwide basis (e.g., computer-assisted instruction, Michigan Education Assessment Program); and others were conducted on an individual or small-group basis with teachers who conducted action-research projects in their classrooms. Other data sources included demographic information, school climate measures, summative evaluations of each collaborative structure, a listing of the roles that project directors played in the project, coteaching surveys, and parent and student satisfaction surveys.

Changes in Student Achievement

In this section, we present two findings: first, wide-scale changes in student achievement, followed by a specific example of how several of the collaborative structures on Project PREPARE worked together. The first finding examines changes in student achievement on both state-mandated and curriculum-based measures. The second finding provides a case of how the collaborative structures that were developed supported writing instruction in the two buildings.

One of the central goals of Project PREPARE was to foster a professional disposition toward disciplined inquiry throughout the entire system. Specifically, we believed that faculty and leaders had to use data in decision making in ways that were educative (but not punitive to individual faculty) while promoting significant changes in curriculum and instruction.

Michigan Educational Assessment Program (MEAP)

Michigan employs a mandated, statewide assessment program in Grades 4 (reading, mathematics), 5 (writing, science, social studies), 7 (reading, mathematics), 8 (writing, science, social studies), and 11. These assessments have recently become high-stakes tests with the attachment of a $2,500 college tuition scholarship for 11th graders who successfully pass the test and a $50,000 financial award to individual buildings that have the highest test scores or those buildings that have shown a composite 60% gain across their tests during the previous 2 years.

As noted earlier, when our planning year began in 1996-1997, there was a persistent pattern of low performance during the 5 years prior to the project in both reading and mathematics, indicating that the student achievement rates

Table 3.1. Percentage of Students Scoring Proficient in Reading, Mathematics, Writing, and Science MEAP

	1996-1997		1997-1998		1998-1999		1999-2000	
	District	State	District	State	District	State	District	State
Grade 4 reading	17.8	49.0	29.2	58.6	47.7	59.4	38.2	58.2
Grade 4 mathematics	26.2	60.5	37.6	74.1	45.0	71.7	55.9	74.8
Grade 5 writing	44.2	73.4	23.2	64.3	39.0	54.8	61.3	67.8
Grade 5 science	16.8	36.8	16.2	40.4	16.2	37.5	30.5	43.6

were relatively stable. The results in both reading and mathematics at the fourth-grade level and in writing and science at the fifth-grade level during the first 4 years of Project PREPARE are shown in Table 3.1. The state of Michigan average is also provided as a comparative indicator. In all cases, the entire district population who took the test and were not excluded (i.e., special needs students whose IEP indicated they were excluded) are reported, with a range of 107 to 125 students across five to seven classrooms per grade each year.

The range of fourth-grade reading scores on the MEAP during the 4 years prior to Project PREPARE and the planning year was between 17.8% and 27.0% Proficient. During the first 3 implementation years of Project PREPARE, the scores ranged from 29.8% to 47.7% Proficient. Mathematics scores steadily increased from 26.2% Proficient in the planning year to 55.9% in Year 4. In looking across both reading and mathematics, there has been a narrowing of the gap between the percentage of fourth-grade students who have successfully passed the test and the state average percentage of students passing the test.

In fifth-grade writing, scores climbed 38% from Year 2 to Year 4, coming to within just 5 percentage points of the state average. After nearly identical scores for the first 3 years of the project (16.2-16.8%) in science, we adopted an experiential, standards-driven science curriculum in Year 4 of the project. The result was a near doubling (from 16.8% to 30.5%) of the number of students rated Proficient in Year 4. When examining the data across the years of the project, with the single exception of the 1999-2000 fourth-grade reading score, there has been a steady increase in the percentage of students passing the reading, mathematics, and writing area tests and a corresponding decrease in the gap between the state and district averages. As a result of a composite gain of more than 60 percentage points during the 1998-1999 and 1999-2000 school years,

Table 3.2. Changes in Entering Reading Levels, Grades 2 Through 5

	> 1/2 year below grade level	<1/2 year below grade level	At or above grade level
Grade 2			
1999-2000	1%	36%	63%
1998-1999	21%	24%	54%
1997-1998	29%	38%	33%
1996-1997	28%	36%	36%
Grade 3			
1999-2000	20%	24%	56%
1998-1999	39%	6%	45%
1997-1998	40%	18%	42%
1996-1997	54%	3%	43%
Grade 4			
1999-2000	38%	15%	47%
1998-1999	40%	6%	54%
1997-1998	52%	14%	34%
1996-1997	51%	21%	28%
Grade 5			
1999-2000	34%	8%	58%
1998-1999	47%	6%	47%
1997-1998	50%	7%	43%
1996-1997	62%	0%	38%

the elementary school received the "Golden Apple" award and the $50,000 stipend for their exemplary improvement in student achievement.

Curriculum-Based Measures

Several curriculum-based measures also provide evidence of changes in the pattern of student achievement. Table 3.2 shows the beginning-of-the-year reading placement levels of all second- through fifth-grade students over the first 4 years of the project. In Year 1 of the project (1996-97), 48.75% of students in second through fifth grade were reading more than one half grade level below average, and by Year 4, this number had decreased to 23.25% of the students—a reduction of 25.5% among those students most at risk of reading failure (i.e., more than one half year behind grade level). Similarly, in Year 1 of the project, just 36.25% of the second- through fifth-grade students were reading in books at or above grade level, while in Year 4, 56% of the students were at or above grade level. From Year 1 to Year 4, the pattern of decreasing numbers of students more than one half grade level below average and increasing numbers of students at or above grade level held for all four grades. Particularly revealing was the significant decrease (27%) in the number of second-grade students who were more than one half grade level below average (only 1%) in Year 4 (1999-2000). In the 2 years prior to Year 4, the kindergarten faculty began to directly teach reading in leveled (i.e., at the instructional reading level of students) books during the second half of the year. Given the plethora of data that have emerged about the critical importance of early reading success in combating later reading difficulty (Hiebert & Taylor, 1994) and recent studies about schools that have "beat the odds" (Taylor, Pearson, Clark, & Walpole, 1998), it will be critical to follow these students longitudinally to see whether they continue to achieve at these levels. These early indications suggest that our extensive efforts at improving early reading skills (e.g., summer program for prekindergarten through eighth grade, hiring an intensive learning tutor for those students identified as most at risk of reading failure at the primary level, daily computer-assisted instruction in reading and mathematics, direct instruction in leveled reading books for all students, utilizing all teaching and paraprofessional staff to teach reading, hiring a home-school liaison, all-day kindergarten) may be paying dividends.

A second curriculum-based measure was tracking students' performance on the districtwide (K-8) computer-assisted instruction program. Beginning in Year 3 of the project, all students spent 50 minutes per week in reading lessons and 50 minutes in mathematics instruction. Both reading and mathematics instruction on the computer were developed to meet national (e.g., National Council for the Teaching of Mathematics) and state curriculum standards. Daily performance tables were created for each student and included a disaggregation of performance by skill level (e.g., passage vocabulary, reading comprehension) to track differences in particular reading or mathematics strands. Difficulty level was calibrated on a moment-to-moment basis to ensure that exercises were within students' instructional zone. Students' performance was measured and adjusted accordingly during the first several weeks of the program, and an initial placement level was determined for each student. Calculated as a grade-level equivalency score, the initial placement level served as the baseline score to compare end-of-the-year placement levels. The difference between the initial placement level and the final level was termed the *gain score*, which indicated students' growth during a given year, with an expected mean gain score of 1.0 grade levels.

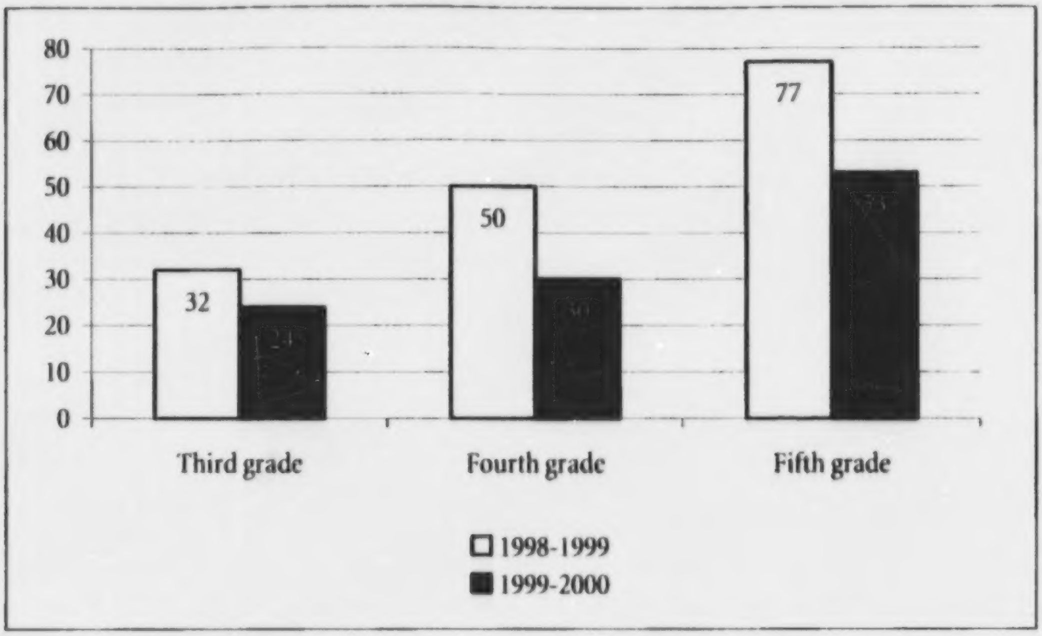
Results of these data for the third through fifth grades during the last 2 years of the project tend to support the reading grade-level data reported previously. Specifically, a decreased number of students was reported to be below average in reading in Grades 3, 4, and 5 from Year 3 to Year 4; the percentage of students below grade level decreased from 43.3% to 36.1% in Grade 3, from 54% to 44% in Grade 4, and from 63% to 44% in Grade 5. In mathematics, a similar profile is revealed when comparing Year 3 and Year 4 scores by grade level, with a reduction from 75% to 68% of Grade 3 students below grade level, 89% to 83% of Grade 4 students, and 97% to 81% of Grade 5 students. While it is still very early in the implementation of a three-pronged balanced math strategy (i.e., separate math curriculum for accelerating the most at-risk students who are more than one grade level behind; computer-assisted instruction for all students; continued professional development in teaching math for high levels of understanding), this movement of students out of the most at-risk category is reflected in the increased percentage of students achieving at or above grade level. Without exception, there was a higher percentage of students achieving at or above grade level in both reading and mathematics across all three grades in Year 4 than in Year 3.

A second indicator that more students were at or above grade level is the increase in the number of students who successfully tested out of the reading program at the 7.5 grade level. In 1998-99, only 11 students across the three grade levels (0 in 3rd, 0 in 4th, 11 in 5th) tested out of the reading program, compared to 37 more students in 1999-2000 (3 in 3rd, 14 in 4th, and 31 in 5th). This increase is a key indicator that the project provides opportunities for the most able students to continue to progress at their instructional reading levels.

A final trend that is noteworthy in the computer-generated data is a leveling effect in the number of students who fell more than a full grade level behind in mathematics. While the state mathematics assessment data show steady increases in the number of students successfully passing the fourth-grade test (26.2% to 55.9% over the 4 years of the project), our computer-generated data show a very discouraging trend, with 97% of our students below grade level at the end of fifth grade in 1998-1999 and 77% of these students one or more grade levels below average. This represented a 45% increase in the number of students falling more than one grade level behind from third to fifth grade (32% of third graders were more than one grade behind, 50% of fourth graders, and 77% of fifth graders). Our data in 1999-2000 show significant improvements, with a 24% decrease in the number of students more than one grade below level in Grade 5, a 20% decrease in Grade 4, and an 8% decrease in Grade 3 (see Figure 3.1). These data also indicate an important shift in the trend toward losing significantly more students at each higher grade, with the highest decreases coming during the fifth grade.

In summary, the achievement levels of students in our partnership site rose steadily and sometimes remarkably since the inception of the school-university partnership. Before engaging in the partnership, the district was entrenched in consistently poor performance as measured by the state-mandated assessment in reading and mathematics in the 4 years leading up to our project. The achievement indicators in both state-mandated and curriculum-based measures demonstrate a strong trend toward reducing the percentage of students most at risk of academic failure and increasing the percentage of those students achieving expectations commensurate with their grade level. This ability to increase students' achievement capacity is particularly striking given the relatively few years of curriculum implementation and the early stages of targeted professional

Figure 3.1. Decreases in the Percentage of Students More Than One Grade Level Below Average in Mathematics



development in reading and writing. However, the data also indicate that in spite of these positive trends, many students continue to perform below grade level, particularly in mathematics.

The mandatory and voluntary collaborative structures discussed earlier in this chapter created an informational framework for moving emergent ideas created in several voluntary structures. The adoption of a writing curriculum, targeted professional development, and significant increases in students' writing achievement on the state-mandated fifth-grade performance test over a 3-year period serve as one example of the transition between mandatory and voluntary activities.

The Interaction of Collaborative Structures to Affect Writing Instruction

In January of our 1st project year, we began meeting with a group of teacher-volunteers at each building who expressed interest in participating in a teacher study group—a group that would meet on a biweekly basis to provide teachers a source of new information about teaching and the opportunity to develop their own action-research projects. The elementary building's group studied instructional interventions from two previous research projects that focused on teaching literacy to students with mild disabilities: the Cognitive Strategy Instruction in Writing (Englert, Raphael, & Anderson, 1992) and the Early Literacy Project (Englert, Raphael, & Mariage, 1994; Englert, Garmon, Mariage, Rozendal, Tarrant, & Urba, 1995; Mariage, Englert, & Garmon, 2000). Both interventions had a positive impact on writing achievement for learners at risk of educational failure and for students with learning disabilities. While we knew that there was no formal writing curriculum at the school, we were unsure of the extent to which writing was being taught but suspected that little emphasis was being placed on writing, making the subject one potential point of entry for teachers interested in improving their practice.

During the first several months, the group studied acceptable and unacceptable examples of students' writing and discussed five common problems of young writers: activating background knowledge, failure to use text structures, difficulty organizing ideas, failure to perceive self as an informant, and not becoming metacognitive of strategies that good writers use. We then introduced the acronym *POWER* and a series of think-sheets and other instructional scaffolds that addressed each of the five common problems and guided teachers through *planning* one's paper, *organizing* ideas, *writing or drafting*, *editing*, and *revising*. Teachers viewed videotapes of each phase of the writing process and discussed critical features of effective writing instruction: thinking aloud, modeling a language and discourse of writing, transferring control of the meaning-making process, helping students to become metacognitive of using strategies throughout the writing process, using discourse to scaffold thinking, making writing meaningful and purposive by identifying authentic audiences. They also examined and scored writing samples using holistic, primary trait, production, and audience sensitivity ratings. Finally, they were introduced to an interactive writing event known as "Morning Message" (Mariage, 2001). From this induction into writing instruction (through the Cognitive Strategy Instruction in Writing, or CSIW) and exposure to a balanced literacy approach (through the Early Literacy Project), nearly all of the study group teachers began to incorporate some aspects of writing in their classrooms, especially Morning Message. Two fifth-grade teachers became very interested in improving their writing instruction as their action-research project, with both of them openly admitting that they had "no idea" how to teach writing, even though the state-mandated writing test was given in fifth grade. A later examination of all teachers across Grades K through 5 determined that just 3 to 5 of the 38 teachers routinely engaged their students in the writing process.

Several key events energized the teachers. First, the building team leaders in literacy for the recently implemented school improvement process took many of the emerging writing instructional ideas to their grade-level teams. Over time, elements of both instruction and assessment were built into school-level student outcome documents. Second, as a result of our work on writing assessment, especially on assigning and scoring an informational paper called the "expert paper" (students write about something in which they are an expert), the entire elementary building's faculty agreed to give the expert paper on a pretest/posttest basis as one of their major writing assessments.

The voluntary collaborative structure of the study group created an ongoing conversation about writing and helped emergent dialogues about writing become part of the instructional culture. Faculty attempted new instructional practices, invited a project codirector to model writing for their classes, created artifacts of writing in their classroom (e.g., think-sheets, procedural facilitation tools), discussed writing assessment data as part of their grade-level teams, conducted multiple workshops on how to embed writing strategies in the inquiry units during summer school, and planned together in the mandatory districtwide accreditation process. One fifth-grade teacher's action-research project, which combined interactive writing in Morning Message with the process-writing approach of CSIW, made possible a comparison with another fourth-grade classroom that utilized interactive writing and independent writing (such as journals) but not CSIW.

The focus on writing produced positive results. Students in the combined interactive-writing-plus-CSIW classroom increased writing production by 118%—a jump from an average of 152 words on the pretest to 330 words on the posttest, the average number of paragraphs from 1.86 to 5.64, and sentence length from 11.21 words to 15 words. On the pretest, 10 of 14 students wrote only a single paragraph, but all 14 students wrote more than one paragraph on the posttest. In the "control" classroom, there was a 25% increase in production—from an average of 79.26 words on the pretest to 107.2 words on the posttest, the average number of paragraphs from 1.13 to 1.20, and average sentence length from 10.2 words to 10.8 words. Perhaps most striking, there was no change in the number of students who wrote more than a single paragraph from pretest to posttest in the control classroom, with 13 of 15 students writing just one paragraph on both the first and the last writing measure.

The results of this initial comparative study in Year 2 of the project began a process of using data from our students to create our own stories—to show that students in our district, when taught using highly effective, research-based methods, could achieve at high levels. Over the next 3 years of the project, the North Central Outcomes Accreditation/School Improvement literacy team agreed to adopt its first-ever writing curriculum for Grades K through 5. One of the project codirectors provided targeted professional development for the district through a series of inservice workshops during Year 3. The professional development had an immediate impact on students' writing performance in several of the fifth-grade teachers' classrooms, and each classroom had a higher percentage of students pass the writing MEAP in Year 4 than in Year 3. Moreover, the two classes with the fewest students passing the exam in Year 3 (labeled Teachers 4 and 5) had among the most significant gains in writing production in Year 4 such as higher scores on the writing MEAP (Figure 3.2), more extended text (Figure 3.3), and more paragraphs to structure their texts (Figure 3.4). Perhaps not surprisingly, the students of the fifth-grade teacher who chose writing as an action-research area in Year 1 of the study (Teacher 1)

Figure 3.2. Percentage of Students Passing the Fifth-Grade MEAP Writing Test During 1999 and 2000, by Teacher

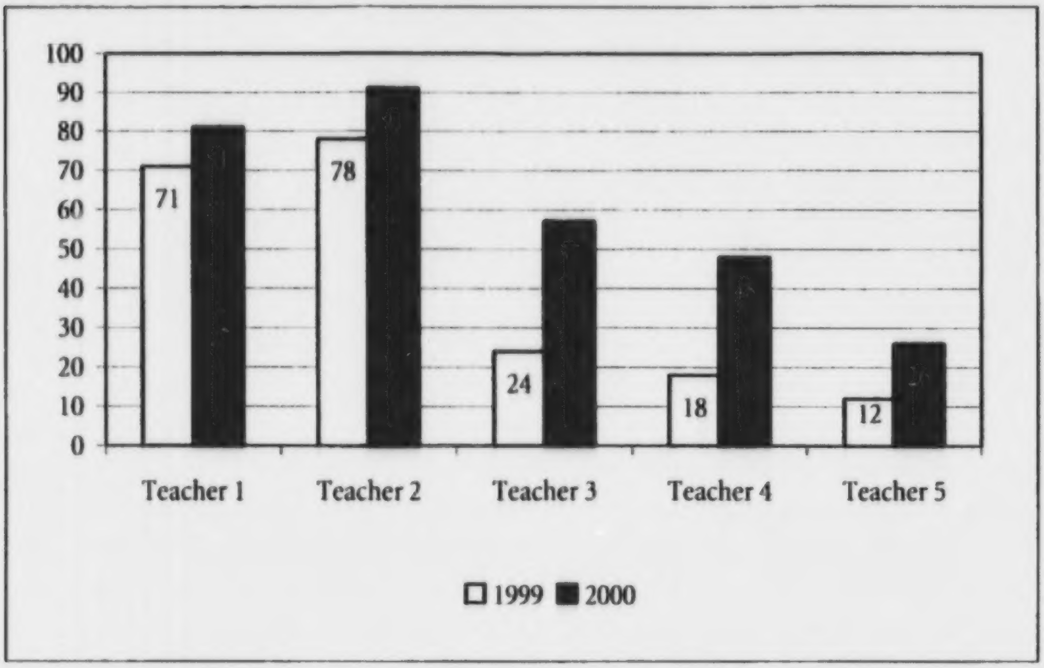


Figure 3.3. Average Number of Words Per Student on 1999 and 2000 Fifth-Grade MEAP Writing Test, by Teacher

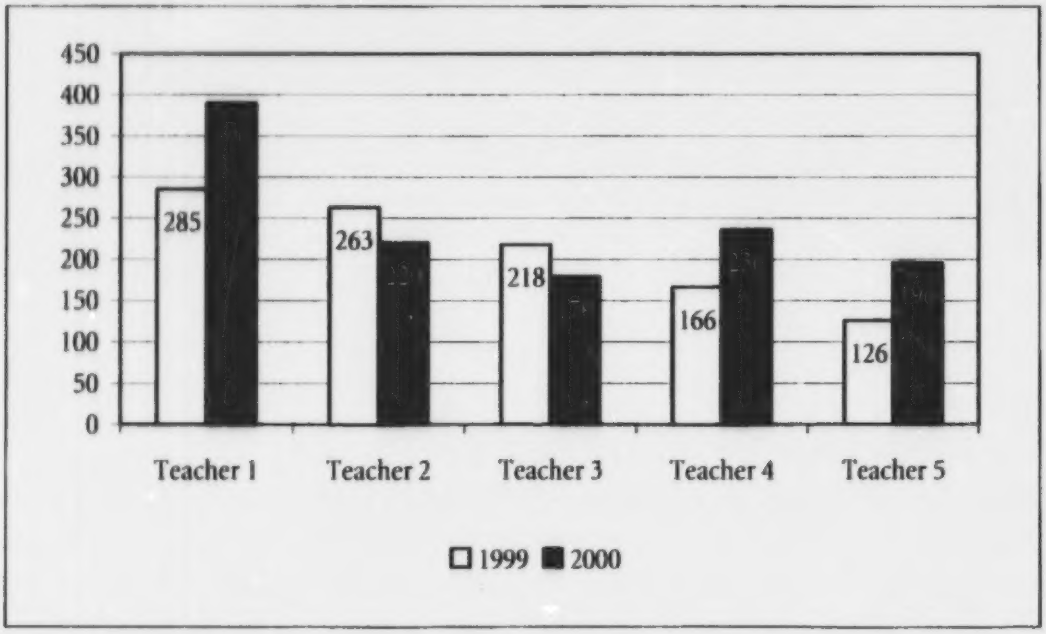
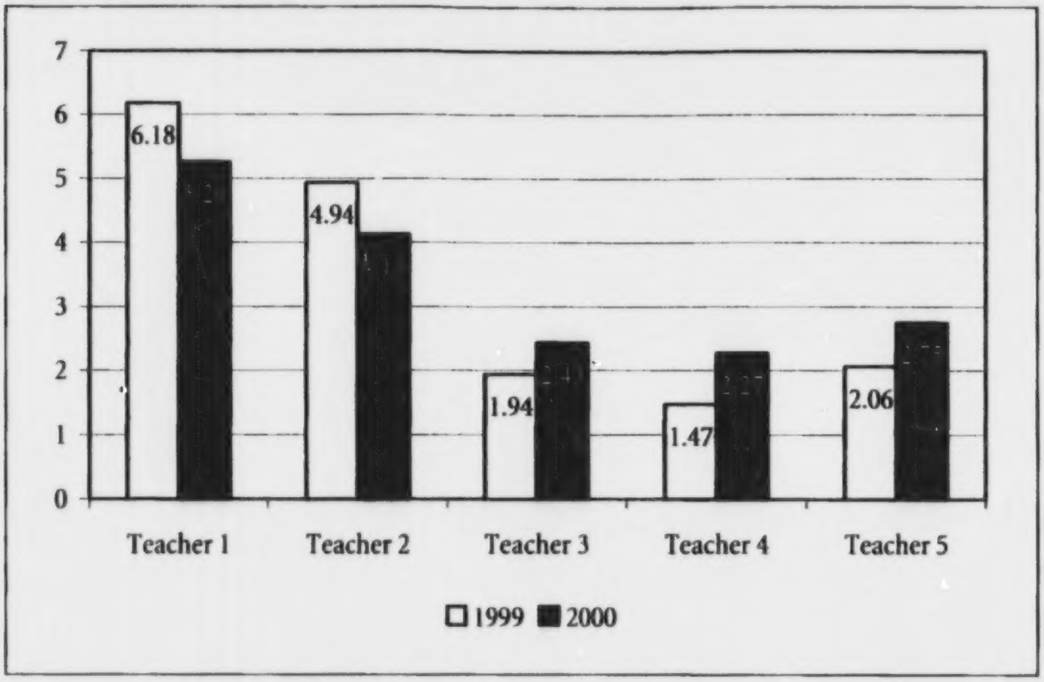


Figure 3.4. Average Number of Paragraphs Per Student on 1999 and 2000 Fifth-Grade MEAP Writing Test, by Teacher



had the second-highest percentage passing and the highest average production level and number of paragraphs. That teacher had been able to refine his utilization of CSIW over time, a practice that has shown to be a key indicator of the most effective teachers (see Englert, Mariage, Garmon, & Tarrant, 1998). During his initial year of teaching writing in Year 2, Teacher 1 had 6 of 17 (35%) students pass the writing MEAP, compared to 12 of 17 (71%) in Year 3 and 17 of 21 (81%) in Year 4. These data show the direct impact of the partnership on teaching that led to measurable gains in the percentage of students passing the state-mandated writing test and on a wide range of informal quantitative and qualitative measures of writing performance.

Evidence Linking Partnership Activities With Outcomes

The collaborative efforts supported by Project PREPARE changed instructional processes directly and indirectly at three levels. They supported curriculum alignment efforts generated by the school district and provided consultation, professional development, and access to additional resources; created new collaborative structures that were not present before the partnership; and provided conceptual leadership and vision for change efforts that were eventually undertaken by the district (e.g., summer school, home-school liaison, grade-level intervention teams).

The voluntary collaborative structure of the study group served as a catalyst for creating data and a discourse for teaching writing. This discourse allowed faculty to share knowledge about writing instruction that affected teaching performance and led to significant improvements in writing on both formal and informal measures. Other collaborative structures, including the mandatory structures of the North Central Outcomes Accreditation/School Improvement Planning Process and the grade-level planning teams, moved the faculty from the relatively isolated action-research projects to schoolwide implementation. The development of the various structures allowed new knowledge to become shared with a "community of practice" (Wenger, 1998).

Although it is more difficult to link to students' significant gains on state-mandated assessments in both reading and math, the summer school program is another component with which Project PREPARE has helped the district to conceptualize a set of guiding principles, curricular choices, and collaborative structures that have improved teachers' and students' opportunities to learn. Partnerships that attempt to undertake change in the most underperforming schools are likely to benefit from explicit attention to curricular implementation and professional development as well as conceptual leadership for organizing schools as embedded communities of practice for faculty and students.

Conclusions and Implications

Our experiences with Project PREPARE over 4 years lead us to draw several conclusions that have implications for other school-university partnerships seeking to positively affect student achievement. First, the results achieved by Project PREPARE contribute to the mounting evidence that professional development that is of high quality, takes a longitudinal perspective, and is targeted in classrooms can have a positive impact on teaching practice and lead to improvements in student achievement (Hassel, 1999; North Central Regional Educational Laboratory [NCREL], 1998). Unfortunately, most teachers do not experience the types of programs that have the potential to foster significant and lasting change in teacher quality. Time constraints, failure to reallocate resources for more professional development, and the lack of knowledge and infrastructure for implementing effective professional development are but a few of the major barriers to improvements in teaching (Fullan, 1991; Hargreaves, 1994; NCREL, 1998). If universities and other institutional partners interested in raising student achievement through improving professional development for teachers fail to acknowledge and understand these pervasive challenges, it will be difficult to effect meaningful change.

Second, we learned that creating multiple points of entry for professional development served to create new forums for discourse that addressed the dual goals of arriving at a shared curriculum, standards, and goals and meeting several professional identity needs such as autonomy, creativity, and instructional risk-taking. If school-university partnerships fail to develop, nurture, and support a collaborative infrastructure, it may be more difficult to make schools learning sites that are responsive to the pace of change in the 21st century (Darling-Hammond, 1997; Hargreaves, 1994; Little, 1998).

Third, school-university partnership work in underachieving schools may have more impact when it employs a systemic approach, where change efforts are undertaken in a wide range of areas rather than being limited to one or two areas (e.g., teacher study groups, mentor/intern programs). Partnerships need to build within the site a broad infrastructure for collaboration that allows teachers to collaboratively plan, solve problems, and engage in disciplined inquiry in a wide range of areas. In our project, building a culture of collaboration in our two buildings paved the way for improvements in student achievement. Additionally, our experience suggests that cross-departmental and/or interdepartmental (or cross-college) collaboration can significantly increase the intellectual, economic, and social capital that the university brings to the partnership.

Fourth, understanding the sociohistorical context of a partnership site may be crucial to successfully implementing change. In our project, neither of our buildings was initially organized for professional learning, support, or collaboration. The time that we spent early on learning about the history and current context of the district allowed us to better understand the scope and sequence of our work. Because our needs analysis revealed that there were many factors that resulted in our schools being "stuck" in a pattern of poor performance, the change process in our buildings demanded a type of foundational work that may not be required in schools at more advanced levels of development. The implication for school-university partnerships is that change efforts should be informed by an understanding of the idiosyncratic nature of each partnership site.

Finally, we have seen that the systemic change process has benefited from having both mandatory and voluntary collaborative structures. Specifically, the mandatory structure of the North Central Outcomes Accreditation/School Improvement target area teams created a collaborative problem-solving space where faculty had to examine core standards developed at the state level, develop their own outcome statements for each grade level and content area, and pilot new curricula to best align with these standards and outcomes. Voluntary structures seemed to address equally important professional needs, including professional autonomy, multiple points of entry for professional development, and instructional risk-taking. Moreover, the teacher study group, summer school program, and mentor/intern program brought new knowledge into the system that informed and pushed the school improvement process. In short, the infusion of new knowledge and ideas in one or several voluntary structures often led to interaction effects that were not anticipated, including becoming part of the shared vision of the school district. Voluntary structures created energy points that were believed to be critical for sustaining the change process, creating momentum, and providing sites for individual teachers to take instructional risks and/or create a professional identity.

One key decision we made with Project PREPARE was to think about change as encompassing all stakeholders, not selected groups of motivated teachers. Working with our most entrenched and underperforming schools is likely to benefit from a commitment that includes but extends far beyond targeted professional development in a particular content area. The current national focus on teacher action research as a professional disposition should be and may be best fostered in school-university partnerships, but there may also be a critical need for districts to access a wide range of potential services that can be prompted through wider school-university collaboration. Our hope is that Project PREPARE represents one story of collaboration that can serve to nudge the boundaries of what is possible in growing schools together that can, indeed, become sites for fostering inservice and preservice teachers' learning.

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Student Achievement in Maryland's Professional Development Schools

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This study was designed to test the effect of Maryland's state-funded professional development schools (PDSs) on the achievement of children. The purpose was to provide results from a controlled study so that a conservative estimate of the PDS effect could be obtained. These results begin to fill a gap in the empirical demonstration of the bottom-line effects of the PDS, as few published reports of student achievement in PDSs are to be found in the current literature.

Literature Review

Repeated and exhaustive searches of the professional literature have revealed little in the way of empirical studies of student achievement in PDSs. In contrast, a number of studies report on the effectiveness of school-university "partnerships" with a specific curricular focus. While elements of such partnerships are often an integral component of PDSs, PDS efforts are more broadly focused on total-school reform. And although dozens of papers on student achievement in PDSs have been published or presented at professional meetings, and several books have been published, there remains only a handful of controlled studies, none of which has appeared in the research journals in education. The existing literature is, however, quite informative on matters of PDS philosophy and practices, building mostly on the 1990 Holmes Group work, *Tomorrow's Schools*, in which the basic principles of a fully integrated PDS were proposed. Since that time, as practice has evolved, authors have reported on studies of PDS design and implementation and, in a number of cases, have reported results of PDS implementation on participating teachers and interns. Other reports have focused on the institutional aspects of the PDS partnership, analyzing the organizational and personnel changes that follow the launching of PDS efforts.

Earlier versions of this chapter were presented to the Professional Development School Conference, University of South Carolina (Columbia, March 17, 2000), and the Maryland PDS Research Conference, Anne Arundel Community College (Annapolis, January 27, 2001). This work was supported in part by an Eisenhower Professional Development grant from the Maryland State Department of Education. The authors wish to express appreciation to Bill Schafer for statistical consultation; Maggie Madden for assistance in identifying the schools; Judy Foster, Meezan Hassan, and Kristen Ritchey for data collection; and Bridget Smith for literature retrieval.

The most recent review of the PDS effectiveness literature is contained in an unpublished report prepared for the National Council for Accreditation of Teacher Education by Lee Teitel (2000a), a leading figure in the field of PDS scholarship. In his review, Teitel comments on the limited but emerging evidence, noting that "what has been available has usually been buried amid other data" (p. 13). For example, Judge, Carriedo, and Johnson (1995), in a very thorough analysis of Michigan State University's PDS movement 7 years into the effort, report the tripling of the promotion rate of ninth graders to 10th grade in one PDS and Michigan Educational Achievement Program (MEAP) scores in one elementary school rising from 3% satisfactory to 48% after 4 years as a PDS. Similarly, Wiseman and Cooner (1996) published a reflective essay on one partnership's approach to enhancing a school's writing program and its effects on the writing performance of the elementary students. On the state's achievement test, the percentage of passing scores among children in that program increased from 69% to 82% (1st year) and then to 92% (2nd year).

Devlin-Scherer et al. (1997) report results for the 1st year of an elementary school PDS, one of the first such studies to employ a "control" school design with pre- and posttest results, stratified by student ability. Curriculum-based math tests, a standardized achievement test, and a state-mandated math assessment revealed mixed results, including some significant advantages for the PDS students. However, these results must be viewed with caution given the developmental level of this PDS. In fact, the evolutionary nature of PDS partnerships suggests that measurable changes in student achievement, attributable solely to PDS involvement, must be based upon firmly established reform efforts.

Teitel's review also includes more recent efforts to provide controlled studies of PDSs' effects on high-stakes, state-mandated assessments. None of the studies reviewed by Teitel has appeared in refereed journals, although one study (Pine, 2000) had been subjected to peer review before being presented at a national conference. That longitudinal study found an elementary PDS's 8-year achievement trend to be accelerated relative to the state average as well as in comparison to a traditionally higher performing school. Also reviewed by Teitel (2000a) is another unpublished report from Texas in which 5-year trends in student achievement in an elementary PDS increased in ways described as "dramatic" and "impressive," although the study included neither statistical controls nor comparison groups. More compelling evidence for PDS effects was found in a yet unpublished conference paper from the University of West Virginia Benedum Collaborative and in an internal evaluation report (Teitel, 2000a). These large-scale studies included multiple sites as well as multiple measures of PDS effects. Among the findings, Teitel was particularly impressed by PDS students' significant gains on standardized achievement tests compared to non-PDS students' performance.

Teitel (2000a) concludes his review by characterizing the current knowledge on PDS effects as "tentative" and "growing" and by reiterating the importance of studies that document outcomes. Our study is an effort to advance that agenda.

Method

Overview

The methods and procedures followed a series of decisions that focused the analysis in order to simplify but also to strengthen the credibility of the findings. First, we limited the examination to schools that conformed to generally accepted standards for a PDS. Second, we decided to use the state's mandated achievement test, the Maryland School Performance Assessment Program (MSPAP), as the measure of student outcomes. Finally, we chose to focus on PDSs operating in elementary schools.

Schools

Twelve PDSs were selected from among 30 listed in the 1998 Maryland State Department of Education (MSDE) directory of PDSs. Each school listed in the directory was involved in a PDS partnership with a college or university and was receiving funds from the state through an Eisenhower Professional Development grant. This pool of 30 PDSs was selected as the source for this study because of the accountability provisions of the Eisenhower funding process. To qualify for state funding, each PDS was required to have submitted a detailed plan in which the partnership's essential elements were described and then reviewed by state education department personnel. Annual progress reports were also submitted to the state as a condition for continued funding to ensure that PDSs were implementing a partnership that included all elements of PDSs as determined by MSDE (see Table 4.1).

A further inclusion criterion for our study was that PDSs be completing at least their 4th full year of implementation as of May 2000, when the most recent statewide achievement tests were administered to students. This restriction was to ensure that PDS reform efforts were sufficiently established in each school and that start-up exigencies inherent in the early years of school change would not confound the treatment. Of the 12 PDSs we selected to study, 8 were in their 5th or 6th year, and 4 were in their 4th year of full PDS implementation at the time of the 2000 testing.

Once the 12 eligible PDSs were identified and their status confirmed by local representatives of the partnerships (e.g., university- or school-based coordinators), a complementary "control" group was formed. Our goal was to achieve a comparison sample of non-PDS schools, matched school-by-school to the PDSs along dimensions known to be relevant to school achievement. For this reason, demographic data on the PDSs were gathered, which included for

Table 4.1. PDS Criteria—Maryland State Department of Education

- School- and campus-based preservice teacher preparation
- Continuing education for school-and university-based faculty
- Integration of preservice and inservice components
- Inquiry-based strategies for continuous assessment and improvement
- Substantial emphasis on teaching and learning in diverse and disadvantaged schools

each school the percentage of students (a) eligible for free or reduced-price lunch,[1] (b) with limited English proficiency (LEP), and (c) entering or withdrawing during the 1997-1998 school year.

The resulting database was sorted within each local school district according to the first criterion: free/reduced-price lunch eligibility; the school adjacent to each PDS in this sorted list became the first candidate for matching. The second criterion we considered was limited English proficiency. If the first candidate school's percentage of English language learners was not within a few percentage points of the PDS, the list was further scanned to find the next closest school with a comparable rate of limited English proficiency. After a satisfactory match was identified on these two factors, the schools' mobility rates (percentage of students enrolling or withdrawing midyear) were examined to determine similarity on these dimensions. In cases of ambiguous or multiple matches, the control school was selected with the more favorable demographic profile to prevent any selection bias in favor of the PDS.

To verify the demographic comparability of each school pair, personal contact (by telephone or e-mail) was made with knowledgeable school personnel in each respective district. These representatives were asked to judge whether the pair as proposed was a reasonable demographic match. Such verification was obtained for all 12 pairs. Figure 4.1 displays means by group (PDS and non-PDS) alongside statewide means. PDSs are generally demographically comparable to statewide averages, except PDSs have slightly higher LEP rates.

Measures

Student achievement data were obtained from the state's Web site. The scores are reported in the database as percentages of students in each school who achieved Satisfactory or Excellent levels of performance on the six MSPAP subtests: reading, writing, language usage, mathematics, science, and social stud-

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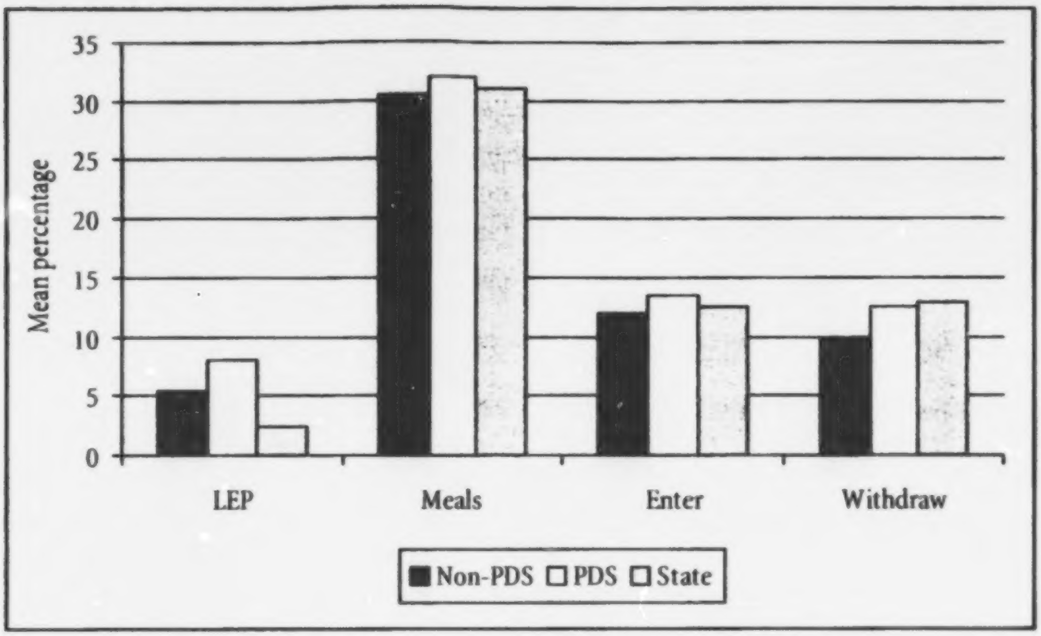
[1] Federal income guideline for family of four in 1998 was $29,694.

Figure 4.1. Demographic Data for Non-PDS, PDS, and State Schools



ies. Data are available for the years 1993 through 2000 and for Grades 3, 5, and 8. (A full description of the MSPAP tests and their scoring, interpretation, reliability, and validity are also available at another state Web site: http://www.mdk12.org.) It is important to note that in these analyses, because of the limitations of the available database, the unit of analysis is the school, not the individual student.

Maryland School Performance Assessment Program (MSPAP)

The MSPAP is a set of six content-specific, criterion-referenced tests administered to students in Grades 3, 5, and 8. Its purpose is to provide performance data for school improvement, not individual student evaluation.

Tests are given in May, with each student participating for approximately 9 hours over a 5-day period. MSPAP is designed to assess students' applied knowledge and therefore requires accuracy in basic skills as well as the application of basic skills to higher order problem-solving tasks. Skills such as explaining, predicting, analyzing, and comparing are tapped. The skills assessed statewide are drawn from published, outcome-based curricula, which are in turn derived from national curriculum standards, such as those of the National Council of Teachers of Mathematics and the National Assessment of Educational Progress (NAEP). Student responses are recorded not through filled-in bubbles but through written text, diagrams, and drawings. Students are occasionally required to work collaboratively to prepare a group response to a problem, but their written responses are scored individually.

Scoring the tests results in assignment of students' performance to a level of proficiency in each subject area or subtest. Reliability, estimated from internal consistency (MSDE, 1999), ranges from .65 to .85—not high enough to make individual-student-level decisions, but generally adequate for schoolwide decision making. Published evidence of MSPAP's construct validity is rather thin and relies mostly on the rough correspondence between results on the 1997 MSPAP and the NAEP results for reading in that same year (MSDE, 1999).

As a further check on validity, we conducted analyses of the statewide database (third graders in 762 schools) to check for construct validity of the six subtests. Correlations between pairs of tests (see Table 4.2) ranged from .87 to .94. A principal component analysis of the six subtests (again, using the 762 schools as the units of analysis) resulted in a first principal component that accounted for 93% of the variance in the correlation matrix. Thus, our analyses do not lend support to the construct validity (as measured by subject specificity) of the subtests.

Data Analysis

We further narrowed our data set in several ways. First, although data are available on schools' performance at both the Satisfactory and Excellent levels, only the Satisfactory-level data were analyzed. (Excellent and Satisfactory levels are highly intercorrelated, and Excellent-level rates reveal evidence of a very clear floor effect). Second, we included data for third grade only in the analysis. Although fifth-grade data were available for the elementary schools selected, the fifth-grade students would have had as much non-PDS experience as PDS experience given the years of implementation. In contrast, third graders in most cases would have been exposed to the PDS "treatment" for the majority, if not all, of their school years. Thus, the treatment contrast between PDSs and non-PDSs could be interpreted distinctly.

To verify the relevance of demographic variables, correlations (Pearson *r*) were checked for the four demographic variables used in control group formation (see Table 4.3). Of there correlations, Meals was the strongest ($r = -.75$), followed by Withdraw ($r = -.63$). These results indicate that schools' performance tends to vary greatly as a function of poverty and mobility of their population.

To answer the primary research question of PDS effects on achievement, the statistical tests of differences between PDS and non-PDS schools' MSPAP performance were designed to detect trends over the 7-year period (*p* values set at .05). These trends would likely be more stable indicators of achievement effects than would year-by-year comparisons, which are subject to some degree of random fluctuation. PDS and non-PDS group trends were compared for linear as well as nonlinear effects over the 7-year period. All analyses were conducted using Statistical Analysis System mainframe software.

Table 4.2. Intercorrelations Among MSPAP Subtests, 1998

	Writing	Language	Math	Science	Social Studies
Reading	.91	.89	.92	.93	.93
Writing		.93	.89	.92	.91
Language usage			.87	.88	.88
Mathematics				.93	.93
Science					.94
Social Studies					

Note. Unit of analysis is school, not individual students.

Table 4.3. MSPAP Subtest Correlations With Demographics

	Meals	LEP	Enter	Withdraw
Reading	-0.75	0.00	-0.55	-0.63
Writing	-0.74	0.04	-0.52	-0.62
Language usage	-0.76	0.04	-0.54	-0.63
Mathematics	-0.73	0.02	-0.54	-0.61
Science	-0.74	0.00	-0.56	-0.63
Social Studies	-0.73	-0.02	-0.55	-0.61

Meals = free/reduced-price meal eligibility, *LEP* = limited English proficiency,
Enter = midyear enrollments, *Withdraw* = midyear withdrawals

Note. Unit of analysis is school, not individual students.

Results

Comparison to State Results

The MSPAP performance of the PDS and non-PDS sites in this study was similar to the overall results for the state in the most recent year (2000). Across the six MSPAP subtests, state averages ranged from 39.2 (reading) to 49.5 (writing). Comparable scores for PDS schools ranged from 38.3 (reading) to 50.1 (writing), and for non-PDS schools, 44.7 (social studies) to 52.7 (writing).

Multivariate Trends

Statistical tests of the 7-year trend results did not support an interpretation of overall superiority (no significant main effects) of either type of school.

Finally, the primary tests of PDS effects over time were analyzed as multivariate comparisons between the two groups' 7-year trends. Figures 4.2 through 4.7 depict the 7-year trends for the schoolwide averages of non-PDSs and PDSs. Specifically, tests of the year-by-type interactions revealed neither significant linear nor quadratic effects that would distinguish 7-year trends in PDSs from those in non-PDSs.

Discussion

Our study was an initial attempt to demonstrate PDSs' effect on student achievement. The results of 7-year trend analyses of achievement revealed no significant differences between groups.

Limitations

The results must, of course, be viewed cautiously, given the limitations of this initial investigation. First, there is no direct assessment of PDS implementation, so treatment fidelity remains an open question. Using only state-funded and state-monitored PDSs was, at best, an imperfect attempt to control implementation factors.

Second, no attempt was made to document changes in actual teaching and learning; it is possible only to speculate what mechanism may or may not directly account for the results. PDS work entails an inherently complex set of interventions, and it is not clear whether any single factor may be sufficient to explain results in the present study or in any subsequent studies. A related limitation is the unavailability of evidence attesting to PDSs' conformity with either state or national standards, only recently promulgated. Third, generalization of these findings is not advisable, given the limitations already discussed, as well as the fact that MSPAP data for the students were analyzed in the aggregate, not disaggregated by race and gender.

Finally, verification of the trends observed here awaits results of future years' assessments. Those who would look to the data on student achievement for justification of professional development schools will need to be patient. Long-term trends over a number of years are required to assess the impact of comprehensive school change.

Linking PDSs With Achievement

A most thoughtful model for linking PDSs with achievement has been proposed and demonstrated by Teitel (2000b). His framework involves a linear but complex relationship running from organizational innovation through role, structural, and cultural adaptations and instructional change, ultimately to improvements in student learning (see also chapter 1 in this volume). The strength of Teitel's framework lies in its power to explicate the processes involved at every stage in PDS implementation and their potential for effecting changes in learner outcomes. Admittedly, the present study represents a short-circuiting of Teitel's model. If any significant PDS effects on student achievement had been observed, it still would have been necessary to further examine the specific nature of the interventions to determine the precise mechanisms

Figure 4.2. Grade 3 Percentage Satisfactory, Reading: 1994-2000

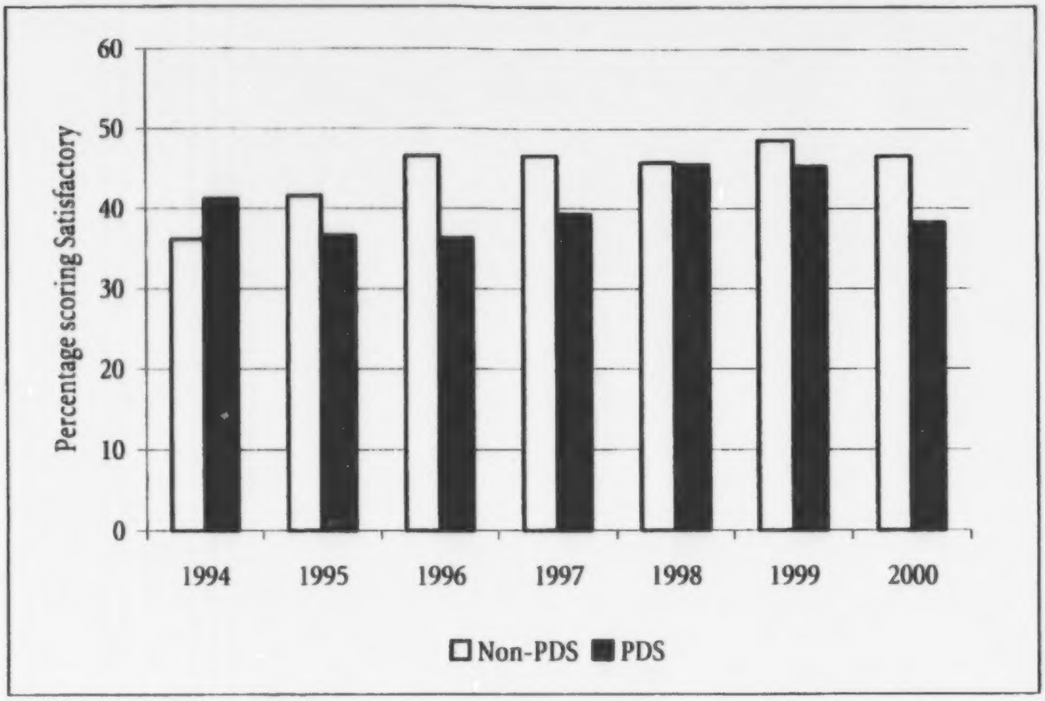


Figure 4.3. Grade 3 Percentage Satisfactory, Writing: 1994-2000

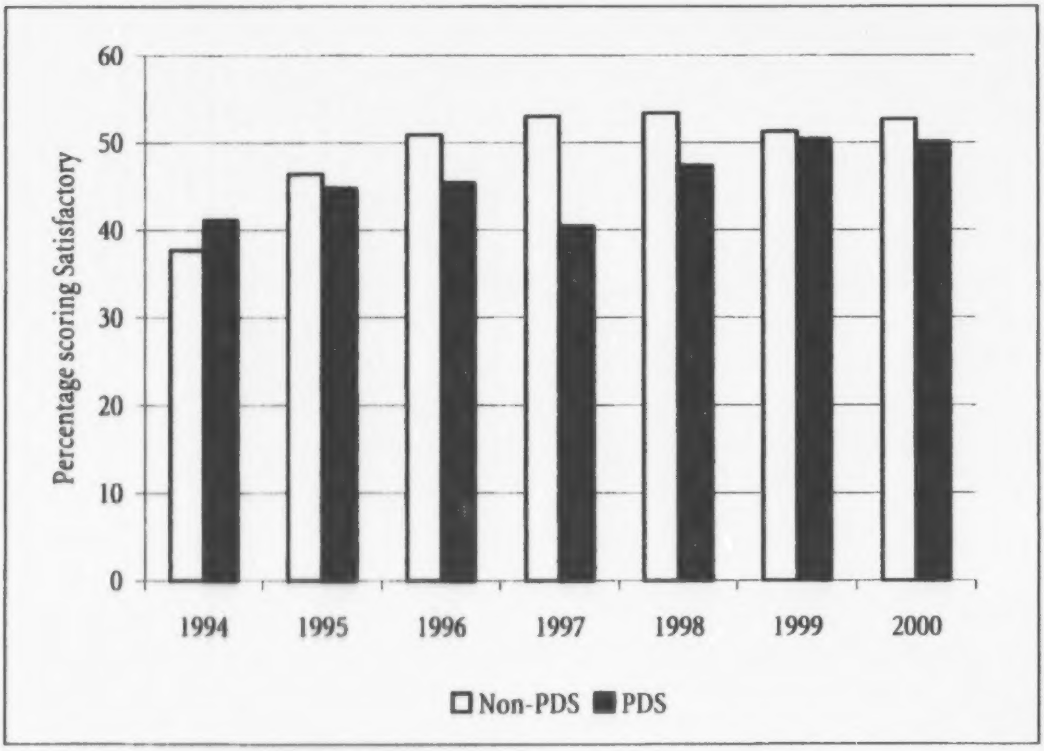


Figure 4.4. Grade 3 Percentage Satisfactory, Language Use: 1994-2000

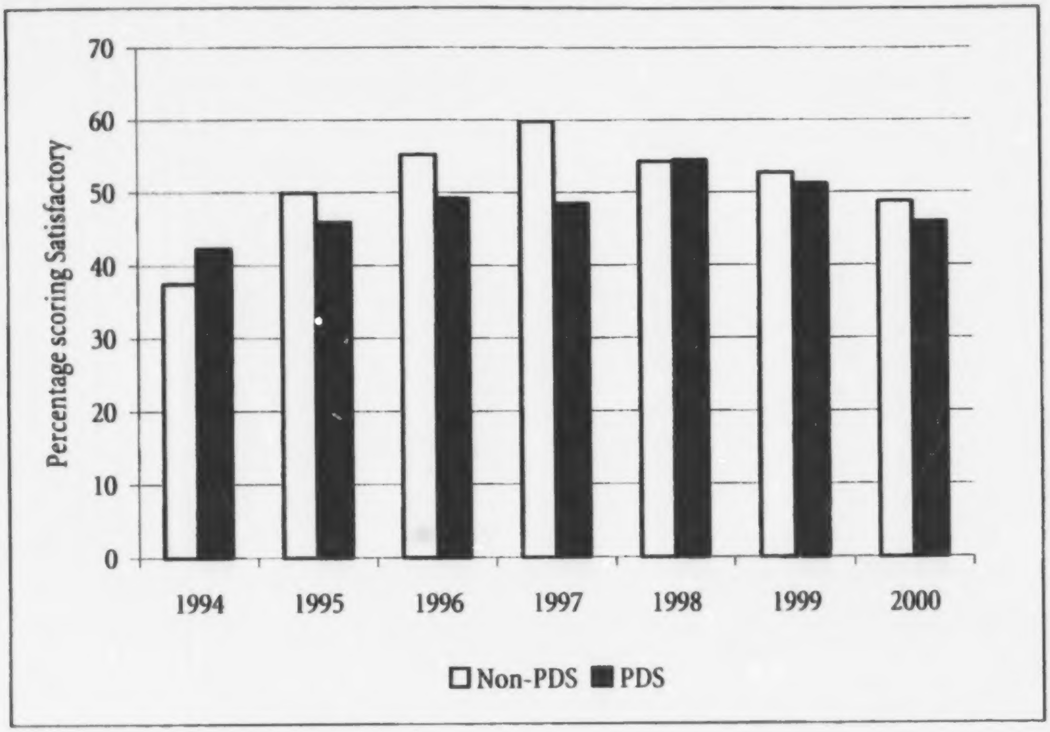


Figure 4.5. Grade 3 Percentage Satisfactory, Math: 1994-2000

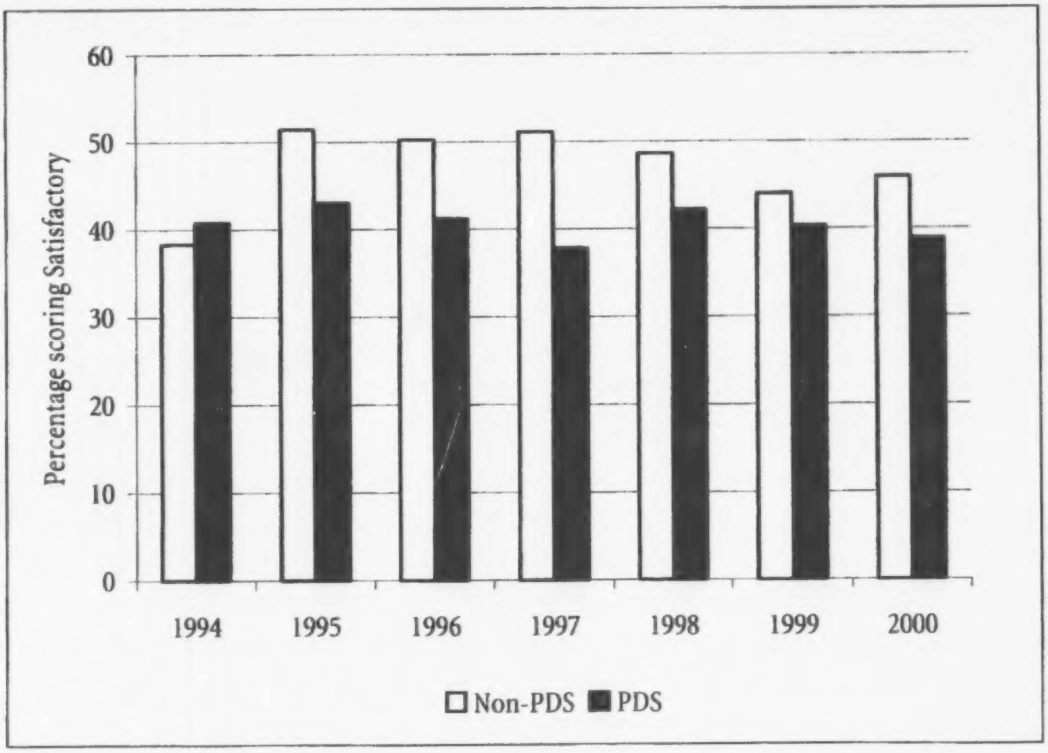


Figure 4.6. Grade 3 Percentage Satisfactory, Science: 1994-2000

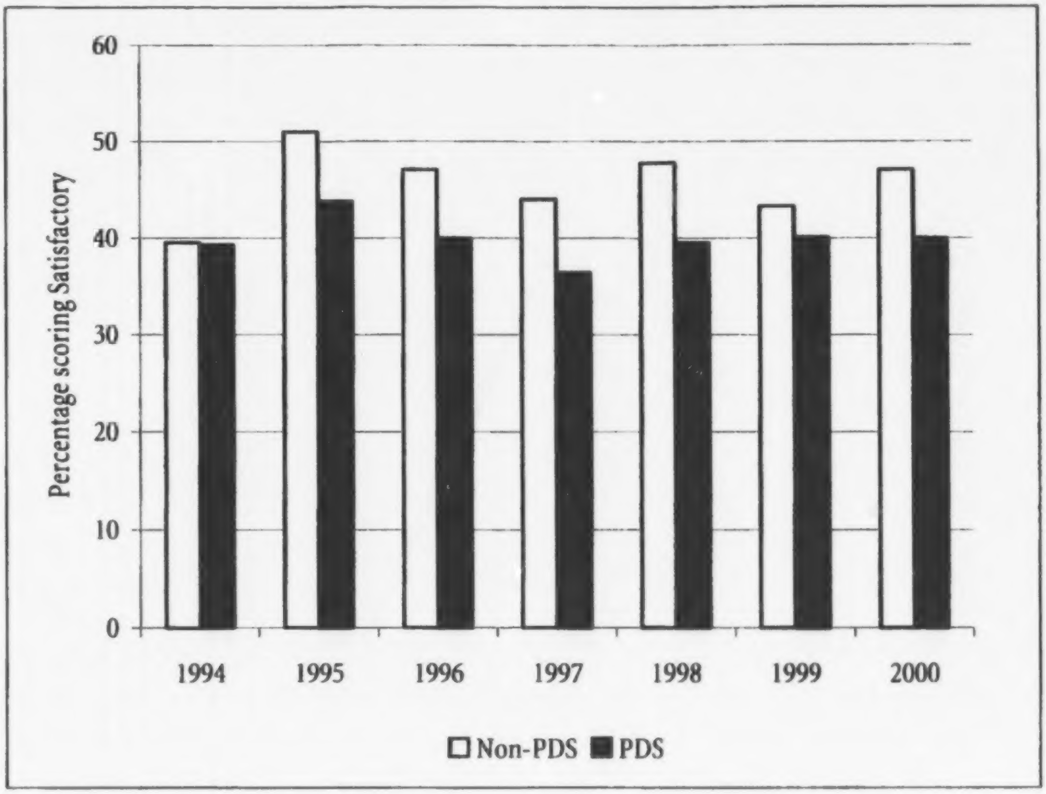
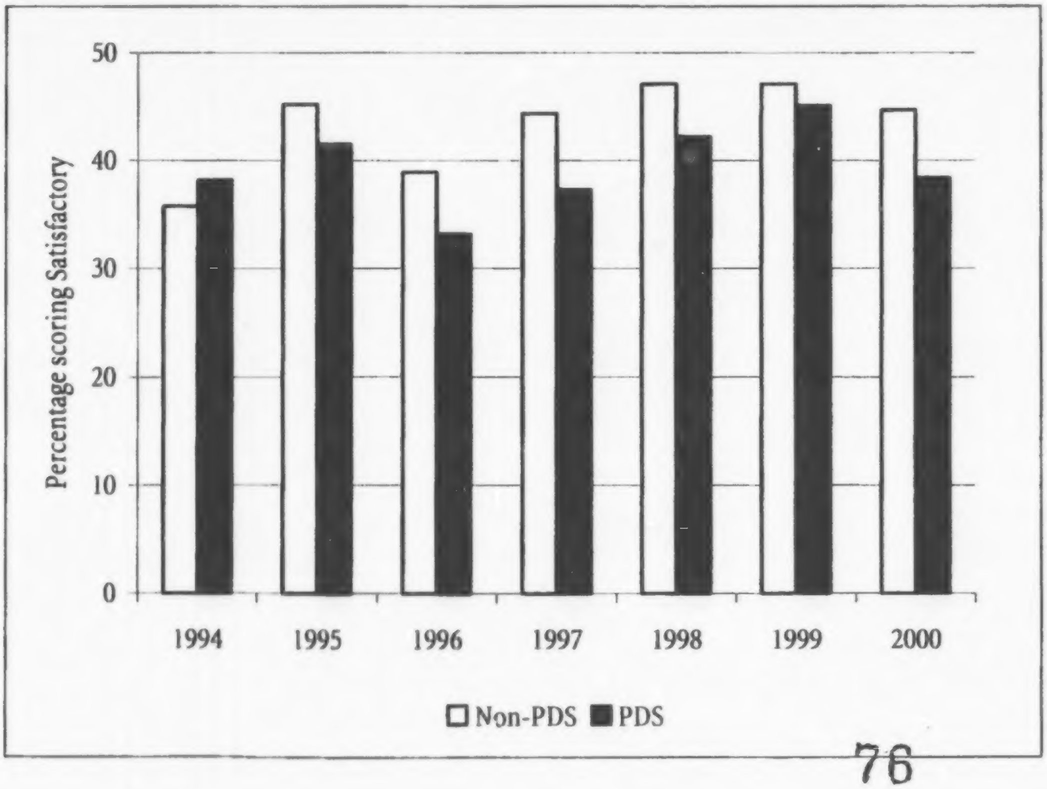


Figure 4.7. Grade 3 Percentage Satisfactory, Social Studies: 1994-2000



through which changes occurred. Nevertheless, the present study is offered as a modest methodological advance over many of the existing studies that failed to provide adequate control in their analysis of PDS effects.

Looking Ahead

We anticipate that there will be continuing and intensified interest in achievement in PDSs. Perhaps one of the greatest challenges facing researchers who attempt to confirm the link commonly associated with PDSs and increased student achievement will be controlling for the confounding variables typically present in PDSs. In fact, many PDSs in the state of Maryland benefit from an array of initiatives provided at the school system, state, and federal level that fall outside the confines of the PDS partnership. Nonetheless, it seems appropriate to offer some reflection on the results of this study to guide future efforts. In that spirit, we have attempted to identify factors that may, as Teitel's model suggests, link PDS interventions with increases in student achievement.

Breadth of Mission

PDSs are intended to effect broad, systemic changes in education both in schools and in the universities and colleges with which they are in partnership. In addition to raising student achievement, the scope of these changes includes (a) identifying standards and standards-based assessments in teacher preparation, (b) similarly, applying standards and assessment in ongoing professional development, (c) integrating new-teacher preparation and ongoing professional development to achieve congruence and to alleviate existing tensions, (d) reforming curriculum both in schools and in universities, and (e) enhancing action research and inquiry processes as they aim to improve the profession's understanding of teaching and learning. Furthermore, there has been a consistent emphasis on the effects of poverty and other forms of educational disadvantage as targets of opportunity for PDS efforts. Given the breadth of the PDS mission, research into student achievement will necessarily be incomplete as long as the multiplicity and complexity of the PDS mission is not addressed.

Works in Progress

Intended to effect complex and systemic change, PDSs are said to be always in a state of development. The PDS sites included in the sample analyzed for this study are certainly not exceptions to this generalization. Although the study's design aimed to minimize the effects of start-up by sampling only from the most mature of Maryland's PDSs, the partnerships we observed may have been still in their period of gestation. Initial efforts focus on forming the necessary personal and professional relationships and working out logistics inherent in the collaboration of two institutions with different institutional cultures, calendars, and missions.

Early designs of Maryland's PDSs certainly paid attention to student achievement, but it was not until the most recent rounds of state grant competitions for funding that student achievement was expected to be placed at the heart of the PDS structure. Only then was achievement considered to be of primary importance as an outcome, thus becoming the essence of accountability. This observation reflects the national trend for PDSs, which focus on inservice and preservice teacher education during the initial years of the partnership with the presumption of a positive effect on student achievement (Abdal-Haqq, 1998). Although this focus may explain the dearth of research on student achievement in PDSs, the lack of data is troublesome for Abdal-Haqq (1998) given the fiscal resources devoted to PDSs throughout the United States. "It suggests that student learning has heretofore been of secondary importance to PDS programmers" (p. 32).

In his evaluation of a PDS in Michigan, Pine (2000) attributes the increase in PDS students' scores on the statewide assessment to a "relentless" focus on achievement in all aspects of PDS design. Future studies in Maryland and elsewhere will need to ensure that a similar emphasis on achievement is built in to PDSs.

Stretched Resources

The PDSs included in the present study were selected in part because of their having received Eisenhower (federal) funds through the state's department of education. It is not known whether these PDSs received substantial additional funds from the partner institutions, nor can we determine the extent to which such additional funds would have contributed to detectable effects. The University of Maryland, as one partner institution, relied exclusively on the Eisenhower grants for the new dollars applied to the PDS effort, with the rest of its contribution of personnel and nonpersonnel resources coming out of existing program funds. Although the Eisenhower grants were substantial (approximately $60,000 to $70,000 per year) and renewable for 3 to 4 years, the type of systemic, broad-based, and institutionalized changes implied in a PDS effort could be reasonably judged to have been underfunded and therefore not likely to produce significant and sustainable changes in outcomes for students on such a demanding assessment as the MSPAP. Unlike many school-university partnerships that focus on a specific aspect of the curriculum, PDSs are expected to facilitate broad-based changes across the curriculum. Nonetheless, as a result of limited fiscal and faculty resources, the PDSs in this study may have benefited from professional development focused on one aspect of instruction, which may or may not be assessed on the MSPAP. Moreover, PDS involvement is often an "add-on" for school and university faculty rather than a new undertaking in lieu of other responsibilities. Consequently, some faculty members hesitate to make the initial investment in PDSs, and those who do often experience rapid burnout due to the complexity and demands of the partnership (Abdal-Haqq, 1998).

Measuring Achievement

MSPAP is only one way, albeit a critical one, of assessing student achievement in PDSs. As our study points out, MSPAP is a test with a mixed record of validation, and its results are highly associated with the income level of the population served by schools. While we support continuing efforts to detect MSPAP gains as a consequence of PDS reforms, we also recommend using an array of alternative assessments, including classroom-based (e.g., student portfolios, work samples, journals, report cards, student motivation and self-esteem, as well as teacher observations and evaluations) and curriculum-based assessments administered more frequently and tied to specific instructional designs operating in PDS classrooms at all grades.

Teachers

Teitel's model posits changes in instruction as a mediating factor in boosting achievement. Our experience suggests that such instructional improvements are occurring in PDSs but are accompanied by other effects on teachers' practice of their profession. Most notably, we have observed the effects of PDS partnership on the allocation of teachers' time. As mentoring roles have evolved and assessment of interns has moved to comprehensive assessment of performance, and as ongoing professional development and administrative tasks and meetings have multiplied, the time teachers spend focused on instruction represents a smaller proportion of their effort. Hence, in order to improve the quality of instruction in the classroom and facilitate total school reform, master teachers have been taken out of the classroom and away from their students.

In addition, classroom instruction has become increasingly the responsibility of interns. Our experiences support those reported by Abdal-Haqq (1998), in which some administrators are concerned about negative effects on student achievement when interns are placed in classrooms where students are administered standardized tests at year's end. In contrast to administrative concerns, some teacher educators are reportedly concerned that such a placement focused on test preparation hampers an intern's ability to "think outside the box" and implement a constructivist curriculum. Although an increasing expectation in the PDS arena, it may be unrealistic to expect student achievement gains in classrooms where interns, the most inexperienced of novice teachers, are placed for a 1- or 2-semester practicum. Nonetheless, while the results of our analysis fail to show a positive relationship between PDSs and student achievement, there is also no evidence of a negative relationship between placement of interns in classrooms and student achievement as measured on the MSPAP.

While we expect that in the long run, such changes will have positive effects on instruction and, therefore, on achievement, the present results suggest that there may be a short-term price to pay for such long-term gains. Extension of the present study and initiation of additional studies will be required to test this assertion.

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CHAPTER 5

Turning Student Voice Into Student Outcomes

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Professional development schools (PDSs) have been characterized as having a dual objective: They seek to enhance learning and development in both preservice and inservice teachers. While much research is being conducted regarding the implications of PDSs on preservice teacher education and teacher leadership (Darling-Hammond, Bullmaster, & Cobb, 1995), little has been written about the effects on public school students who are recipients of the educational changes that result from PDS partnerships. Still less has been said about what students perceive to be the impact of having such a program in their school (King, 1996). In fact, young students are more often thought of as beneficiaries of change than as active participants in the change process (Fullan, 1991).

Because schooling is one of the main influences on students' learning and development of worldview, it is essential that researchers and educators take note of the ways in which children perceive their educational experiences (Lincoln, 1995). Studies including student perspectives have shown that students' insights provide important and valid information about their own learning (Lincoln, 1995; Rademacher, Schumaker, & Deshler, 1996; Klinger & Vaughn, 1999). Knowledge of students' views of instructional practices and school reform can be useful to both preservice and inservice teachers as they work toward greater teacher effectiveness (Vaughn, Schumm, Klinger, & Samuell, 1995). For the development of successful PDSs, it seems imperative to listen to what students say about the educational reform that is taking place in their own classrooms and schools. Including the student perspective in the school reform dialogue may lead to more positive student outcomes. By providing information from a variety of stakeholders in the university-school partnership, a broader perspective of what is occurring at a PDS site will emerge (Clark, 1999).

The purpose of this chapter is threefold. The first purpose is to share the results of a research study designed to describe the thoughts and feelings of students in Grades 4 through 8 who were enrolled in selected PDS sites. The second purpose is to describe specific PDS implementation activities that targeted the thoughts and feelings of the students in the PDSs. The third purpose is to report student outcomes that appear to be linked to implementation activities that grew out of student voice.

PDS Site Description

The major PDS described in this chapter is a partnership between a Texas university and a large, inner-city elementary and a nearby middle school. The university's teacher education program certifies more than 400 new teachers a year. The majority of the preservice candidates who participate in teacher preparation at this university are monolingual, European American females from middle-class backgrounds and therefore exemplify the growing demographic mismatch in the United States between the teaching force and the public school population. The partners viewed the university-school partnership as an opportunity to better prepare new teachers for a rapidly changing student population.

The elementary school site, located in an area of town with a poor media image due to an overemphasis on crime, has a prekindergarten through sixth-grade student population of 1,100 to 1,200 students. Despite the poor image, there is a waiting list of students whose parents want them to attend the school. At the time of the study, approximately 90% of the students were Latino, and 700 of the students were considered limited English proficient. When this university-school partnership began in 1992, the school had a very low passing rate (19%) on the statewide exam. The school lacked resources in technology with only a few computers to serve the entire population. After the first 2 years of the collaboration, there was little teacher turnover, resulting in a relatively stable teaching force. The opposite was true of the position of principal, which changed hands every 2 or 3 years.

The middle school is located only a few blocks from the elementary school. It has demographics and teacher/administrator characteristics similar to the elementary school. Together, the schools provided the university two very diverse settings in which to place student interns in a variety of K-8 classrooms.

At the time of the research described in this chapter, the PDS teacher activities were in the 4th semester of implementation. The program guidelines have remained essentially the same in subsequent years. Each general education elementary and middle school intern is expected to do student teaching in two separate classrooms for at least 6 weeks each. Special education interns split their student-teaching time between one general education placement and one special education placement for students with mild to moderate learning and/or behavioral differences. Three university professors typically conduct intern supervision, and one serves as the site coordinator for the PDS. The site coordinator divides her time between the elementary and middle school sites to plan and direct PDS activities with faculty and administrators. All three professors are usually on site to visit classrooms, conduct classes, and participate in weekly reflective seminars with interns.

The professors who conducted the following research study at the site were interested in how elementary and middle school students perceived the changes that were taking place in their schools as a result of the university-school partnership. While impact on student perceptions is an important focus for study of PDSs, they also anticipated that gathering information from the public school students about their learning experiences would help to inform teacher preparation programs about how to more successfully meet the needs of academically diverse learners. Focus group discussions were conducted to gather student opinions. Based on the focus group results, a survey was developed and administered to other students in the school and to other PDS sites throughout the state.

Research Methodology

Four questions guided the investigation to gain student perceptions:

1. What is the students' understanding of the purpose of the PDS?
2. What are the students' perceptions of advantages and disadvantages of the PDS?
3. From the students' perspective, what is the affective and academic impact of the PDS?
4. What do students believe teacher educators should teach to prospective teachers so that all children succeed in schools?

The investigation was conducted in two parts. The first part of the study included focus group discussions with 37 students to gather answers to each research question. The second part of the study included the development and administration of a survey that was based on the focus group results. This survey was given to a larger number of students (439) from urban, suburban, and rural PDS sites to validate the focus group responses and to gain more information on how students view teaching and learning as a result of their involvement in PDS schools.

Focus Group Method

Four focus groups were formed that were representative of diverse students in Grades 4 through 8. The 37 students who participated in the focus group discussions were recruited from both the elementary PDS and the middle PDS. A research assistant visited each classroom to explain the purpose of the project to students. Permission forms to participate in the study were distributed to students and parents by the classroom teachers. When all forms were returned, each teacher was asked to select five students from the group who they believed would be likely to openly share their thoughts and feelings with the researchers in a productive way. Finally, four separate discussion groups were formed with no more than 10 members each.

The makeup of focus groups was diverse in grade level, gender, ethnicity, language, and academics. They included special and regular education students in Grades 4 through 8. The groups included Asian, African American, Latino, and European American students. Academic diversity was represented by students performing in the high, average, and below-average range of classroom performance according to teacher judgment.

The focus groups were conducted during school at preestablished times acceptable to the teachers in order for participants to leave the classroom without significantly interfering with the teaching and learning process. Each discussion group lasted approximately 2 hours. A standard protocol was followed for each of the four meetings. One faculty member served as moderator to pose the questions. Another faculty member served as the facilitator to collect and help cluster responses. A research assistant was present to take notes and record each meeting with a tape recorder. Students were asked to write as many answers to a particular question as they could on separate cards before responding orally.

Six questions were designed that seemed appropriate for tapping students' perceptions of the teaching and learning that was taking place in their schools as a result of the PDS model. Proposed questions had been previously shown to expert consultants for feedback on whether or not the questions would be clear and concrete enough to be understood by the students. Consultants included members of the school leadership team who had been involved in the PDS program from its beginning along with three university faculty members who had previous experience in conducting focus groups.

Several types of measurement systems were used to identify and validate the students' perceptions of teaching and learning. First, written responses of focus group members for each research question were gathered during group meetings. Participants recorded their written responses individually on notecards using statements of one to six words. The recorded statements were reactions to the particular questions that were asked by the moderator. The notecards were clustered into sets by the focus group members and given a categorical label that was also written on a card.

A student team member rating and voting sheet was also developed. The purpose of this form was to verify each participant's perception of the importance of each category that had been generated by the group. After rating the categories, students were asked to vote for one half of the categories (e.g., if they had identified six categories, they were asked to vote for the three categories they valued most). From the voting portion of the sheet, a group rank based on member votes was derived for each category.

Survey Method

Based on the categories generated by focus group students, a survey was created. The survey questionnaire, titled "In My Opinion," had three main parts. The first two parts asked students to report basic information such as name, grade, age, gender, and ethnicity and included information about the format

Table 5.1. "In My Opinion" Survey

Rate the following statements from 1 (*strongly disagree*) to 5 (*strongly agree*).

1. I believe that the Professional Development Center is in my school so the student teachers can learn how to teach kids.
2. I believe the student teachers are in my school to help students learn for the future.
3. I believe university professors are in my school to help student teachers prepare for teaching.
4. I think the Professional Development Center program has helped me to become a better student.
5. I think that my student teacher has helped me to learn in new ways.
6. I think my teacher has gotten some new ideas from my student teacher.
7. My student teacher makes learning interesting and fun.
8. When I have too many student teachers in one year, it is hard to get used to their different ways of teaching.
9. I believe the student teachers are not strict enough.
10. I think some students misbehave more when the student teacher is teaching.
11. I feel good about having a student teacher, especially when I learn something new.
12. I feel proud that the Professional Development Center is in my school.
13. I feel happy about the student teachers because everyone knows we are learning new and exciting things.
14. I behave and learn the same with my student teacher and my regular teacher.
15. I learn more when we have student teachers because there are more teachers in the room to help me.
16. I learn respect for myself and others from my student teacher.

Answer the following questions.

17. Is there anything else you want to share about your experience with your student teacher?
18. What do you think we need to teach student teachers so that they will help *all* children succeed in school?

and purpose of the survey. The third part consisted of statements for students to rate on a Likert scale from 1 (*strongly disagree*) to 5 (*strongly agree*), plus two open-ended questions (see Table 5.1).

To generate interest, cartoon-like drawings were placed in the margins, and the questions and statements were worded in child-appropriate language by using actual phrases from the focus group discussions. Three university experts in the field of teacher education and three faculty members familiar with PDSs reviewed the survey to assess its overall reliability.

Teachers at PDS sites where student teachers were assigned in Grades 4 through 8 were asked to give the survey to their classes—both where the focus study had been conducted and at other PDS sites throughout the state. A total of 439 students from seven sites completed the survey.

Table 5.2. Focus Group Results

Survey questions	Themes of responses
1. What is the students' understanding of the purpose of the PDS?	• Interns in school to learn to teach and help students learn • Professors in school to help students learn
2. What are the students' perceptions of advantages and disadvantages of the PDS?	*Advantages:* Create better students; help students learn in new ways; help teachers share new ideas for teaching; make learning more interesting for everyone *Disadvantages:* Adapting to multiple ways of teaching somewhat difficult; interns lacking in management strategies; student misbehavior a problem when intern in charge of class
3. What is the affective impact of the PDS?	• Enhanced pride in learning • Proud to have program in school • Happy to learn in new ways
4. What is the academic impact of the PDS?	• More teachers means more opportunities to learn • Respect learned for other students and interns
5. What do students believe teacher educators should teach to prospective teachers so that all children succeed in school?	• Teach interns how to teach in content areas • Teach more techniques for classroom discipline • Teach how to relate to students in positive ways

To analyze and report the results of the focus group, the researchers examined the categories of comments that were rated as most important by each of the four groups (Cowart & Rademacher, 1998). The focus group questions and a summary of student responses appear in Table 5.2.

Surveys were analyzed and reported using descriptive statistics. Mean ratings on the items among the 132 elementary students ranged from 3.77 to 4.23. Mean ratings for middle school students ranged from 3.21 to 4.16 on each item; few differences in responses to each question were noted between elementary and middle school students (Cowart & Rademacher, 1998). Highest means were reported by elementary students, who strongly agreed that student teachers had helped them to learn in new ways (4.23) and had made learning interesting and fun (4.22). The highest means reported by middle school students indicated agreement that student teachers were in their schools in order to learn how to teach (4.16). The lowest agreement reported by both elementary (2.64) and middle school students (2.28) was with the notion that student teachers are not always strict enough.

Analysis of written comments from the focus groups and survey responses were clustered into categories resulting in four themes. First, according to students, university professors should *teach discipline methods.* Students suggested that "student teachers should be taught to be more strict because if they are too easy with kids who misbehave, it makes learning hard for everyone." The second theme was *recognize student diversity* as illustrated by a student response such as "There are different students and different ways to teach them." For the third theme, *make learning interesting,* one student commented, "Try more things so we do other things besides worksheets, like read plays or novels, or even act out skits or something." The fourth theme, *teach how to teach,* is captured by the comment, "My teacher needs to know how to explain things better so everyone understands" (Cowart & Rademacher, 1998).

The survey of student opinions was used by participants at the PDS site to implement programs, projects, lessons, and other activities that would coincide with student recommendations. As a result, four distinct teacher education activities were implemented to acknowledge student opinions. Accomplishment of the teacher education activities occurred concurrently with impressive improvements in test scores and an increase in attendance rates. Listening to the public school students and acting on their suggestions led to the development of teacher education activities that had a positive impact on teaching and learning at the original PDS site. In a unique way, students were involved in program design and implementation. As the most important members of the PDS partnership, students were able to participate in a critical area of program development. Furthermore, actively attending to the four themes described above helped to facilitate enhanced learner outcomes (Darling-Hammond, 1994).

Activities That Supported Major Themes of Student Responses

Each off the four major themes is described below along with related activities implemented to address students' concerns.

Theme 1: Teach Discipline Methods

To address concerns of some K-12 students that student teachers needed to be "more strict," professors encouraged the student teachers to examine their practice in terms of how consistent they were in relying on and reinforcing the discipline plan that was already in place by the mentor teacher. One seminar was also dedicated to teaching the "SLANT strategy" (Ellis, 1991). The steps of SLANT are to Sit up, Lean forward, Activate your thinking, Name key information, and Track the talker. This strategy teaches students "how to learn" by showing them how to demonstrate teacher-pleasing behaviors during times when they are required to respond in some way to the teacher's instruction. Specifically, the student teachers learned how to pretest their students to determine which ones would benefit most from the strategy; describe the strategy to their students by explaining the steps and why they are important in creating a positive learning cycle; model the strategy through think-aloud and role-play activities; provide

Table 5.3. Student Teacher Comments on SLANT Strategy

"The students really had fun with this. They wanted to practice at lunch!"

—Grade 3 student teacher

"I can't believe the great change in Susie since she learned this strategy. This strategy was like a magic pill for her."

—Grade 4 student teacher

"Jose had been quiet all semester. We really worked on ways to 'activate your thinking,' and he is answering more questions now."

—Grade 6 student teacher

"I really didn't think this would work. I was amazed at how the few kids who were causing me trouble bought into this strategy. They are so much more cooperative and are paying much more attention to my lessons."

—Grade 9 student teacher

"I taught SLANT in the resource room and encouraged the students to practice it during English class. Can you believe that an English teacher who has one of my students commented on how much better he had been paying attention in her class? [The student] is really proud of how he uses this strategy."

—Middle school special education student teacher

verbal practice for students to memorize the steps of the strategy; conduct practice activities to ensure mastery; and then posttest their students on the strategy to determine whether positive behavior changes occurred.

Student teachers kept a log to indicate what they had learned as a result of their teaching experience and to record students' reaction to the strategy. They then shared their projects at the end of the semester. A recurring theme among student teachers' comments was that they felt they had acquired a tool for engaging students in a fun way that supported the kinds of positive behavior they expected of their students. Most student teachers were pleased with the decrease in students' negative behaviors after they had learned the strategy. The comments shown in Table 5.3 support this theme. The student teachers' comments indicate not only a general satisfaction with the SLANT strategy but also an improvement in student behavior that appeared to contribute to greater student attention, more class participation, and enhanced self-esteem.

Theme 2: Recognize Student Diversity

To better prepare student teachers at the PDS for an ethnically, linguistically, and academically diverse student population, the site coordinator and the professors developed a PDS institute that had a focus on these areas of diversity. The first objective of this institute was to create an awareness of the unique needs and requirements of different students, helping the interns to recognize and accept student diversity. After building understanding of and knowledge about the students, the second objective of the PDS institute was to teach and model techniques, strategies, lessons, and units that would be helpful in the classrooms. The impact the institute had on interns and their elementary students may be illustrated with the following example.

One of the interns had been in her fourth-grade placement for 2 weeks when she confided in the site coordinator that most of the language-minority students in her class were failing the dictation type of spelling test. She indicated that these students, who comprised more than half of her class, were demoralized and not motivated to study because they couldn't pronounce or spell most of the words. She said that she believed after the institute lessons on language-minority students that they were not lazy, just lacking enough exposure to the language to develop the oral proficiency they needed to be able to write words from dictation. The site coordinator and the intern developed a different type of spelling test for the same words: a multiple-choice test that would accommodate these students' level of language proficiency yet assess their recognition of the words for the week. After the first test, the intern was ecstatic, saying, "You could see the satisfaction in their faces when they realized this was a spelling test they could understand." She reported that the lowest grade for the class was in the mid-80s. The intern was hooked on searching for appropriate ways to teach and assess the learning of students whose first language was not English. Another encouraging benefit to the intern's awareness and creativity was that her mentor teacher informed the site coordinator that her language-minority students were so motivated to study after their successful spelling tests; she decided to continue using different types of assessments when warranted by the needs of her students.

Theme 3: Make Learning Interesting

The Quality Assignment Routine (Rademacher, Deshler, Schumaker, & Lenz, 1998) was the intervention chosen to address students' concerns that the student teachers diversify their teaching repertoire. This routine contains a planning sheet that prompts teachers to create a motivating assignment different from the traditional worksheet format. During the planning process, teachers consider the learning and motivational characteristics of diverse learners by offering them choices on a final product and how to complete it. The routine also includes methods and procedures for involving students in assignment explanations so they acquire all the necessary information to produce quality work and to earn an acceptable grade.

The student teachers were presented with an overview of the components of the Quality Assignment Routine during a seminar meeting. Under the supervision of the professor, they then used the planning sheet to create an assignment that would fit into a unit of instruction they were currently teaching. Student teachers were also encouraged to engage their students in a discussion of the finished assignment to give them positive and corrective feedback. The

Table 5.4. Student Teacher Reflections on Quality Assignment Routine

"This planning sheet really helped me generate new ideas for assignments. My mentor teacher liked it and we used it together to plan three interesting assignments on Greece."

—Middle school social studies student teacher

"I had small teams work together and plan an assignment using the planning sheet. They decided to work in groups of three and design a poster of ancient tools and how they were used for the Egyptian people. Each group member was responsible for explaining the poster to the whole class. They loved it! I was amazed at the quality of their work."

—Grade 6 student teacher

"One of my students who never turned in assignments did an excellent job on the one we planned where he had choices on how to create his science mobile. He especially liked the fact that he had a choice of when to turn the assignment in to me."

—Grade 3 student teacher

planning sheet and a student product that represented what students had learned as a result of the assignment were to be included in student teachers' end-of-semester portfolios. The result of the focus on this theme was that student teachers offered students a variety of choices in assignment completion and ensured that students had clear directions on how to create a quality product. The interns' reflections point to student growth evidenced by increased assignment completion, greater motivation to complete assignments, and improved quality of student work (see Table 5.4).

Theme 4: Teach How To Teach

To assist interns in developing better knowledge about how to teach and explain lessons to all students, a stronger emphasis was placed on effective planning and preparation for instruction. Lesson plans based on a modified version of Hunter's (1984) lesson cycle had always been required of the interns at the PDS, but more examples of well- and poorly written lesson plans and practice in writing lesson plans seemed appropriate during institute seminars. In addition, graphic organizers and the Unit Organizer Routine (Lenz, Bulgren, Schumaker, Deshler, & Boudah, 1995) were taught so that the interns would be better organized in lesson and unit implementation. Interns indicated that the planning tools helped them to know in advance what they were trying to accomplish with lessons and units and allowed then to plan ahead for possible areas of difficulty. Interns also noted that learning how to assess their students' knowledge by doing a task analysis for new learning objectives helped alleviate teaching above the students' level.

A critical component of the lesson plan module taught to the interns is the focus strategy. This part of the lesson plan requires interns to plan for making a statement of the learning that is about to take place, relating to student interest

Table 5.5. PDS Outcomes and Recognitions

Year	PDS outcome/recognition
1993	Successful Schools Award—$130,000 from the state education agency
1994	Silver Schools—school district award
1995-1996	Statewide exam scores continue to improve yearly (rising from 19% passing in 1992 to 80% passing in 1998)
1996-1998	Received $200,000 grant from the Institute of Texas Cultures and AT&T
1999	Teacher at PDS named Distinguished Clinician of the Year by Association of Teacher Educators

or experience and prior knowledge, and involving the students. Several interns said learning how to use the focus strategy at the beginning of a lesson assisted them in effectively securing student attention for what was going to be taught. In addition, interns overwhelmingly believed that the lesson plan module answered the question of what to do first, second, and so forth. Mentors have commented that the lesson plan format helps the interns in the area of pacing and lesson focus, resulting in more time for the task of learning.

Student Outcomes

The collaborative process at the PDS continues to yield positive results for university faculty, preservice teachers, inservice teachers, administrators, and—most important—students. During the time of collaborative endeavors, the elementary school went from being ranked a low-performing school in 1992 to being ranked in the top quarter since 1996. Some of the changes that have occurred at the school are shown in Table 5.5.

Two elements that may have had a positive impact on student growth are student and teacher attendance rates and teacher retention at the school. Each PDS principal reported improved student attendance (see Table 5.6). One explanation for the improvement may be what the student-voice study respondents reported as enhanced self-esteem over having been selected as a school to participate in the partnership. The positive feelings of the students also relate to student outcomes through motivation to attend school regularly and learn. This may be even more important in inner-city schools that generally receive mostly negative attention. Because enhanced self-esteem contributes to intrinsic motivation, involvement in a special program may promote feelings of competence and control over learning, which are necessary for successful knowledge acquisition to occur (McCombs & Whistler, 1989).

An important indicator of students' growth is improvement in their passing rates on the statewide exam. Initially, test scores at the school improved

Table 5.6. Summary of Percentage of Students Mastering Statewide Exam and Attendance Rates

	1994	1995	1996	1997	1998	1999	2000
Percentage mastering statewide exam							
Math	42.1	59.2	67.3	74.1	78.5	78.9	67.0
Reading	57.9	60.3	63.0	68.8	72.9	71.0	62.6
Writing	63.6	68.2	76.8	79.5	70.1	83.8	56.2
Student attendance rate (percent)	94.3	95.3	96.0	96.7	96.1	97.1	96.1

Note. Adapted from Texas Education Agency (2001).

dramatically and rapidly (see Table 5.6). In 1999, a new general superintendent required the testing of thousands of students districtwide who had previously been exempt from the exam because of language or ability differences. The results showed no dip in the percentage passing other than on the reading portion of the exam for these students. Beginning in spring 2000, the state education agency removed further exemptions from the test by reducing the number of years a language-minority student could wait to take the test from 3 years to 12 months. While 25.9% of language-minority students were exempt from taking the exam in 1999, only 2.2% remained exempt in 2000 (Texas Education Agency, 2001). With more than 700 language-minority students taking the test for the first time, the school experienced a drop in mastery rates. While the practice of testing children in a language they do not comprehend is widely debated and somewhat defeating to students and teachers, the principal and teachers believe they can help all students at the PDS to successfully meet this challenge.

Survey respondents indicated that interns had helped them learn in new ways. Specific initiatives aimed at facilitating learning in different ways included after-school tutoring provided by the interns 2 days each week, workshops for preservice and inservice teachers on how to teach language-minority and academically diverse students, a National Aeronautics and Space Administration workshop on hands-on math and science for interns and mentors, and a significant infusion of technology into the school and curriculum. Since the time of the research study, two additional computer labs have been added to the school. Selected fourth- through sixth-grade classes also have been chosen to participate in distance-learning projects with other schools and universities.

Linking Activities to Learner Outcomes

How have activities implemented by the university and the PDS produced the desired results? The major student outcomes at the elementary school were greatly increased mastery rate on statewide exams, improved attendance for students, and more positive feelings about school because of participation in a PDS project. The increase in the percentage of students passing the statewide exam cannot be attributed to any single activity or factor but rather stems from a combination of activities planned in collaboration between university and school partners to facilitate an environment that is a better place for children to learn. Listening to and acting on student opinions provided a direct link between theory and practice and allowed faculty from both partners to select more appropriate curriculum and activities for all participants.

In the implementation of the research project, students were included in the collaboration and planning process. Their opinions were solicited and valued. Through informal focus groups, students were allowed to talk about the teaching and learning that was taking place in their schools. Through the "In My Opinion" survey, it was possible to learn more about the academic and affective impact of the PDS on students' lives.

Listening to student voices serves a valuable purpose in guiding the reform effort in teacher education. In this example, the students suggested that greater emphasis be placed on classroom management strategies, making learning interesting and fun, and presenting content in a way that is easily understood by a group of diverse learners. Student input provided both inservice and preservice teachers a means for reflection and growth as successful educators. As a result, teachers, interns, and teacher educators investigated better strategies to assist preservice teachers with these student concerns and implemented activities to address them. As the new teacher education activities were being implemented, the school experienced rapid improvement. If there had been no appreciable student growth or decline during this time, it would be difficult to connect the student outcomes to anything being conducted at the PDS. However, the impressive gains of the students allow a case to be made for linking the educational improvement at the original PDS site with the research-based teacher education initiatives. The improved student achievement at the school validated the activities that were based on best practice. Additionally, the accuracy of student voice was underscored in that students indicated what they needed to achieve school success, and when they were provided corresponding strategies and opportunities, success was the result. Certainly, more research with students is needed to enrich the conversation on how to improve teaching and learning occurring in today's schools, and PDSs provide an ideal arena in which this type of research can occur.

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TARGETED CURRICULAR REFORMS

Student Learning Outcomes in a Partnership Intern Program

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Partnerships promise new ways of working together for both school-based and university-based educators. In this chapter, we describe student outcomes that resulted from new ways of working among faculty members at a college of education and the teachers and administrators at a local middle school. By changing the work relationships of educators, student outcomes were enhanced. First, improvements included decreased school discipline referrals, increased school attendance, and greater participation in after-school programs. These changes led to the second documented improvement—in student reading scores—that is the main focus of this article.

The Partnership

The University of Missouri St. Louis (UM-St. Louis) is a relatively new institution, having been established as a branch of the University of Missouri System in 1963. The flagship campus in Columbia, MO, was founded in 1839 as one of the country's original land-grant institutions. As an urban and metropolitan institution, UM-St. Louis reflects a broad diversity of students, faculty, and programs. Total enrollment at the university is approximately 16,000 students, 40% male and 60% female, many of whom are nontraditional students who hold jobs while attending college. The College of Education enrolls 2,500 students per year and graduates 500 new teachers each year. UM-St. Louis is the largest preparer of teachers in the state of Missouri. Because of this scale and the diversity of the 50 St. Louis-area districts served by the university, changing longstanding work relationships is a difficult and complex process.

Parkway Central Middle School (PCMS) is a suburban school in west St. Louis County that is about 20 miles from downtown St. Louis. The student body consists of 1,040 sixth, seventh, and eighth graders, of whom 80% are resident students and 20% are transfer students from the city. The racial makeup is 70% White, 20% Black, and 10% Asian. Although most students live in a middle-income socioeconomic area, 7.4% qualify for the free or reduced-price lunch program. The building has one principal, three assistant principals, and three counselors. There are 68 teachers and 20 staff members at PCMS. Two faculty members from PCMS also teach on the UM-St. Louis campus as adjunct professors.

UM-St. Louis and PCMS began partnering in 1988 as part of a technology project. Over the years, the partnership has evolved toward greater levels of interaction and a stronger emphasis on school-based learning for preservice teachers and for university faculty. The partnership reflects the goals of the national Holmes Partnership, to which it has belonged since the early days of the Holmes Group (see http://www.holmespartnership.org). The purpose of the partnership is the simultaneous renewal (Goodlad, 1994) of the school and the university, particularly with regard to the preparation of preservice teachers.

A major goal of the Holmes Partnership is the formal preparation and continuing education of teachers through an extensive, collaborative effort involving many partners committed to bringing about a new way of looking at preservice teacher preparation (Schmitz, John, Baber, & Brown, 2000). Compared with candidates at some other institutions, UM-St. Louis preservice students and education majors spend less time in lecture halls and more learning time in K-12 schools, working with practitioners in professional development schools (PDSs), and collaborating with the community in ways that are relevant to the future needs of the workplace and the current needs of the community. PCMS teachers welcome UM-St. Louis preservice teachers and university faculty into their middle school classrooms. The principal of PCMS is especially supportive and is actively involved in the Holmes Partnership. University faculty also have ventured into liaison roles even though these roles were poorly understood by their university colleagues and their promotion and tenure committees. Each one of these groups—preservice teachers, inservice teachers, administrators, and university faculty—have taken a leap of faith that working collaboratively will benefit the children in this school. They also have taken a technology leap together, a move that helped create a true learning community. Veteran teachers became learners again, struggling alongside their middle school students to learn new tools of inquiry. Telecommunications linkages are in place, and two-way audiovisual technology is a planned component of future PDS work. These links create stronger connections between College of Education faculty and practicing professionals in the schools. They also provide multipoint connections between the College of Education, its PDS partners, and the other educational and cultural institutions in St. Louis such as the Science Center, St. Louis Art Museum, and other community resources.

PCMS has begun to experience changes in its cultural, ethnic, and economic diversity. Many students have transferred to the school as part of the region's voluntary interdistrict desegregation program. PCMS also has an unusually large English-as-a-second-language (ESL) program and serves this district of approximately 20,000 students as the ESL center.

Internship Program

UM-St. Louis and PCMS decided to establish a PDS internship program in 1995. The program was designed to provide valuable hands-on classroom experiences to preservice teachers early in their preparation program and provide help to PCMS teachers in meeting individual students' needs in the classroom. During the 1st semester of the program's existence, 12 UM-St. Louis preservice students were placed in sixth-grade classrooms at PCMS. Today, the program has grown to include 40 preservice UM-St. Louis students placed in Grades 6 through 8 and 16 students placed at elementary schools. These preservice teacher candidates are referred to as interns.

Each semester, preservice education students who have completed at least 60 hours of undergraduate college credit can apply to be an intern. Preservice students are employed as aides in classrooms for 15 to 20 hours per week for 16 weeks. Students must commit to 280 hours per semester (approximately 20 hours per week). For their services, they receive a stipend of $750 and tuition remission for a 3-hour course. The money for these benefits is provided by PCMS through resource allocation of their existing school budget. Parkway views this program positively because it provides a number of well-trained classroom aides and a university supervisor for the cost of one or two teachers' positions. PCMS staff voted to invest these salaries in providing interns. Another benefit for the middle school is that all interns sign up as substitutes, which provides a well-trained, knowledgeable pool for the school, preventing much of the loss of academic time that can occur when substitutes are not familiar with the curriculum. This, in turn, is a benefit for the interns, who have an opportunity to practice their skills before student teaching. Additionally, this gives PCMS an opportunity as a prospective employer to see preservice students in action, which has resulted in several interns' being hired by the district.

Selection of interns is made through an application and interview process. From interviews, faculty assess interns' personalities, character, communication abilities, and teaching skill levels to match them with individual teachers and grade levels. Some interns lack self-confidence, some have personality quirks or mannerisms that need attention, and some have not learned to deliver a lesson; these interns are placed with veteran teachers at PCMS who can help in the appropriate development areas.

Two important activities of the internship program are the orientation sessions for interns and teachers. Each semester, an orientation to the program provides specific guidelines to both groups for their duties as members of the program. Interns are informed about basic logistics of working in a school, such as emergency policies, schedules, and parking information. Interns must also complete a substitute application, a criminal record check, and the paperwork to get paid and to enroll in the class. At the end of the orientation session, they are paired with a teacher and are asked to set up their individual schedules.

Once a year, another orientation allows PCMS teachers to discuss PDS issues before the school year begins. The duties of the university faculty member are also clarified and discussed. During this time, the partners reflect on the internship program and discuss changes that might need to be made. From these meetings, the partners have developed and modified an assessment tool for interns, discussed ways to use interns in the classroom, and talked about concerns and recommendations. Four times a year, they also meet under the umbrella of the Professional Development School Collaborative, a network of PDS partnerships in the St. Louis region. At these meetings, administrators, faculty, and teachers meet to discuss vision, goals, objectives, and concerns. The consortium provides an excellent opportunity to share information.

The UM-St. Louis class that is offered at the PDS site gives interns an opportunity to discuss what is happening both at PCMS and in their other classes at UM-St. Louis. The course is supervised by a full-time university faculty member who also monitors the program and acts as a liaison among students, teachers, and administrators. The course serves as a bridge that builds understanding between practice and theory. Other UM-St. Louis faculty have often commented that students who are currently in the internship program, or have been through the internship program, are much better students in their methods classes because of the experiences they have had in the field. Teacher Diana Schumacher, who has been intensively involved in the internship program, explains another angle:

> Some of these university students have come to me ready to teach a lesson, while others are hesitant to even speak a word to my eighth graders. Nevertheless, at the end of the internship, we have all learned from each other and have grown to be better professionals. The internship program gives me extra hands in the classroom. All teachers would agree that no matter what your class size is, you can always use another adult in the room to assist the students. Likewise, the interns get to see examples of good teaching in my classroom. They experience the not-so-good days as well and see how I learn from my mistakes. The program allows for conversations discussing what made my lesson great and what I need to change next time. My intern offers me suggestions that she has learned in her methods classes, which allows me to learn the latest teaching techniques. (Ambrose, Natale, Murphy, & Schumacher, 2000, p. 299)

Table 6.1 provides a breakdown of the stages and most critical activities and strategies in this PDS. In addition, the table depicts the relationship among partnership activities and strategies, intern outcomes, and subsequent student outcomes. (For greater detail about the development of the internship program, see Ambrose, Natale, Murphy, & Schumacher, 2000.)

PDS activities begin with the recruitment of highly motivated and engaging preservice teachers and follow through with the mentoring and reflection built into the internship program. On an individual level, preservice teachers spend additional time (15 to 20 hours per week for a minimum of 16 weeks) in direct contact with students, teachers, school administrators, and parents. They

Table 6.1. PDS Activities Related to Strategies and Outcomes

PDS activity	Strategy	Teacher and intern outcomes	K-12 student outcomes
Intern recruitment	Identify interns with a commitment to teaching and learning, some knowledge of children, and ability to work in teams.	Teacher has an aide in the classroom. Intern has position in school. Substitute pool is identified. Experience may lead to hiring intern.	More adults are present in the classroom with content knowledge and teaching skills.
Orientation	Make sure teachers, interns, administrators, and university faculty understand their roles and responsibilities.	Roles and expectations are clarified before school year begins.	Student needs are met because teachers/interns "hit the ground running" and can function immediately and effectively in the building and classroom.
Mentoring and intervention	Maintain close contact and be available for minor and major crises.	Problems are averted. Few interns are counseled out of field or choose another career.	Students have interns in their rooms who want to be there, want to work with students, and can take responsibility and make decisions with guidance.
Technology integration	Provide enrichment and additional emphasis on reading across the curriculum.	Teachers learn new techniques for classroom technology. Interns apply theoretical knowledge.	Students get extended time on computers during and after school, more reading practice, and more individualized attention and coaching, resulting in increased engagement in learning.
Multiple models of teaching	Offer opportunities for large-group instruction, small and cooperative groups, and one-on-one tutoring. Provide literacy training for interns.	Teachers expand their teaching repertory. Interns observe different styles, practice them, get feedback, and see effects on students. Professionals discuss teaching.	Students benefit from reduced pupil/adult ratio. They experience multiple teaching and learning styles. Each student receives more personal attention. School attendance improves, and discipline incidents decline. Reading scores improve.
Participation in extra-curricular programs	Extend school day and offer enrichment activities.	Interns have more informal time to be with students and learn their interests. Interns participate in life of school, work at sixth-grade camp.	More students participate in after-school programs, have more time on task, and have a stronger connection to school. They create work products and get more feedback from teachers, interns, parents, and fellow students. Students learn to work effectively in teams and build relationships with caring adults in their lives.
Evaluation and reflection	Provide opportunities for formative and summative evaluation and for both personal and group reflection.	Professional growth occurs for teachers at all levels of practice through evaluations, journals, and articles where they give and receive feedback.	Students benefit from an increased attention to teaching and learning and a strong collegial and professional environment in the school.

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are able to work closely with students in cooperative learning groups and at times in one-on-one instruction with diverse students. Their school and university mentors take time to reflect on their work and on the needs of students in the building. Organizationally, the partnership spends time and resources on evaluation, including annual planning retreats, weekly classroom discussions and reflections with preservice teachers, monthly consultations between the PDS teachers and university faculty, cross-site visits by external reviewers and "critical friends," and end-of-year written evaluations to ensure the work is on track for each year's specific objectives.

Mail-in surveys collected feedback on the program from approximately 150 interns who participated over a 5-year period. The survey resulted in a response rate of 33% ($n = 50$). Ten questions asked respondents to rate aspects of their intern experience on a 5-point Likert scale, and six open-ended questions asked what changes they would make in the program and what impacts their participation had had on their subsequent teaching careers. Responses indicate that the PDS activities were extremely valuable; for example, the mean score for the question *Would you recommend to a colleague that they participate in a similar program?* was 4.63. Comments on the surveys indicated that participation in the program helped interns get desired teaching positions and enabled them to start their 1st year of teaching with confidence and competence. A notable outcome of the program was a change of interns' attitude toward teaching at the middle school level; many who had said they were not interested in working with students at that age level changed their minds by the end of their internships. The survey data continue to be analyzed to gain a better understanding of the effect of the internship program on the preservice teachers. Follow-up surveys will continue to track the effects of the PDS activities on these teachers' professional lives.

Methods

Educators are generally reluctant to compare the performance of neighboring schools and student populations. Even with comparable groups, it is difficult to make direct correlation and establish causation in an educational intervention. Nonetheless, this partnership was able to examine another, similar group of middle school students to draw conclusions about the impact of the internship program on reading achievement of PCMS students. The two schools are comparable in that they are located in the same school district, meaning that they share similar per-pupil expenditures, districtwide program interventions, teacher hiring policies, and family socioeconomic patterns. Both schools participate in a voluntary regional desegregation program. While every school is unique, the two groups of students from these schools can be considered as closely matched as possible for demographics and educational resources. Data were gathered on performance in reading, discipline, attendance, and student participation in

Table 6.2. Sixth-Grade Reading Scores—Stanford Total Reading

School A (with interns); $n = 295$		**School B (without interns); $n = 324$**	
NCE	NPR	NCE	NPR
60.5	69	64.3	75

Table 6.3. Seventh-Grade Reading Scores—Degrees of Reading Power

School A (with interns); $n = 295$		**School B (without interns); $n = 324$**	
NCE	NPR	NCE	NPR
56.6	62	56.0	61

[$F(1,614) = .116, p < .73$]

after-school activities. The matched comparison school design, coupled with the analysis of the relationships between strategies and outcomes that Table 6.1 allows, constitutes evidence for linkage between partnership activities and the PCMS student outcomes reported later in this chapter.

The research director for the school district, who was not directly involved in the work of the partnership, conducted the statistical analysis at the request of the principal. The principal wanted to see whether any differences could be attributed to the presence of the internship program in his building. The researcher took reading score data from the sixth and seventh grades of PCMS and the non-PDS comparison school. The sample population included a total of 619 middle school students, 295 at PCMS (School A) and 324 students at the other school (School B).

Two tests were used to measure improvement in reading: the Stanford sixth-grade Total Reading subtest and the seventh-grade Degrees of Reading Power (DRP). While these are both reading tests, it is important to keep in mind that they are different—developed with different samples and normed differently. However, both tests attempt to measure the same skills. In the sample used in this study, the correlation between the two tests was quite high ($r = .8199$, $p < .0001$).

Student Outcomes

Table 6.2 shows that baseline sixth-grade reading scores for School A were significantly lower than those for School B.

By seventh grade, however, the scores of the continuing students in the two schools had converged. School A's students had raised their test scores dramatically and achieved greater reading performance gains than had students in School B (see Table 6.3).

The research director's analysis found that sixth graders in School A showed more improvement in reading performance than their peers at School B. This trend was found for all sixth graders, and it was particularly strong in the case of low-performing sixth graders. In other words, students who were struggling with reading benefited greatly from the additional interaction they received from teachers and interns, from increased one-on-one time and attention with an extra adult in the classroom, and from enhanced opportunities in after-school activities.

To investigate the possibility that this result came from a few students who made big leaps in their reading performance, the analysis went one step further to look at the percentage of students who improved on the seventh-grade DRP test. Because the seventh-grade DRP test is considered more difficult, it is possible to say that more students in School A improved on the DRP, and that the students in School B fared worse in this more difficult comparison at the seventh grade (difference between the two schools was statistically significant: Chi-square = 15.6, *d.f.* = 2, $p < .0004$; see Table 6.4). These data also point toward a conclusion that the student learning that occurred in the school with interns includes substantial improvements that go beyond short-term changes. Longitudinal studies of PDSs need to be conducted to follow this question of the long-term effects on student learning.

Despite the positive findings, the district's research director was cautious in his conclusions:

> The results of all the analyses here indicate that School A students, whether we consider the total group or just the low ability students, demonstrate more improvement in their reading performance than the students at School B. Obviously the analyses cannot tell us why School A students show this superior improvement, and there could be any number of causes. Still, at least, the results are consistent with the hypothesis that the intern program at School A is helping students to make greater progress in their reading skills. (Parkway Central School District, 1996)

In addition to the reading test score improvement, students in the school with the internship program showed documented improvement in conduct, attendance, and participation in after-school programs. Also, because of the additional help provided by the interns, teachers were able to design and implement a schoolwide "Respect and Responsibility Plan."

Several activities helped students understand the concepts of respect and responsibility. Teachers also led students in a discussion of the terms *responsibility* and *respect,* and classes drafted a set of rights and responsibilities.

Behavioral standards also were developed. Principals met with all students to discuss expected standards of behavior. Subsequent statistical data indicated an overall decrease in the number of students involved in disciplinary actions in all areas. Serious offenses to school rules were reduced by half in many cases.

Table 6.4. Changes From Sixth-Grade Stanford Reading Scores to Seventh-Grade DRP Scores

Change in scores	School A (with interns)	School B (without interns)
Seventh-grade scores better	38.0%	23.5%
Seventh-grade scores the same	1.4%	1.2%
Seventh-grade scores worse	60.6%	75.3%

A proactive program called "Catch the Pride" was developed based on a "catch them being good" idea. The goal of this program was to instill a sense of school pride in students. Students received awards for good citizenship, good hallway behavior, picking up trash from the floor, helping other children, improving their attitude or academic achievement in class, doing special projects, being kind to someone, good attendance, homework completion, and other good behavior. Rewards were given in the form of "gold cards" that could be cashed in for prizes and that entitled students to special recognition at all-school assemblies. Additionally, special passes were created that gave students certain privileges. Teachers placed more "good" calls to parents, complimenting their children's behavior. Speakers such as local athletes and celebrities visited PCMS to address the issue of responsibility and respect. Students watched videos about responsibility to the environment. "Random acts of kindness" were initiated by the fine arts classes, and students organized ways to help others by performing good deeds.

In addition to activities focusing on student behavior, after-school tutorials were initiated to improve academic performance. In one of the after-school programs begun as part of the Respect and Responsibility Plan, students learned to use HyperStudio software to create projects and work with their fellow students in cooperative learning groups. Such programs would not have been possible without the help of the preservice interns. Skills students gained in the after-school activities were directly transferable to the classroom.

Planned Expansion

Based on this type of success with local schools and with the performance of preservice teachers, the UM-St. Louis College of Education will pursue development of 15 to 20 new PDS partnerships over the next few years (University of Missouri St. Louis, 1997). Currently, it has four PDSs affiliated with the St. Louis PDS Collaborative, the umbrella group that includes 18 PDSs with seven local universities in the region. Within the partnership, our understanding has grown that a PDS is and will always be a work in progress. We know also that it is extremely difficult to isolate the multiple influences at work on a single learner or a single teacher in a school; we are convinced, however, that the partnership approach is working and are committed to expanding to more schools with more diverse student populations.

A major goal in forming new partnerships is to increase the depth and breadth of field-based experiences for preservice teachers. The state is implementing a set of knowledge and performance standards for beginning teachers. Teacher preparation programs are being evaluated based on their effectiveness in helping their graduates meet the new standards. This move to standards-based teacher education also pushed the College of Education to engage in another step of its reorganization, which involves a curriculum redesign project that will eliminate course-by-course compartmentalization and move the program toward a coherent, competency- and standards-based approach. Field-based experiences are key to meeting this new threshold of authentic teacher performance. Expanding field-based experiences would be impossible, however, without increasing the number and the depth of our partnerships with schools *and* using new technologies to keep the students, campus, and faculty connected. These requirements go hand-in-hand with the need for teachers to understand and effectively use technologies in the classroom to help their students connect with the world at large. They also introduce new challenges such as the redistribution of university faculty resources to support our PDSs.

Conclusions

This chapter has reviewed student outcomes and promising practices involved in partnership work between a university and a middle school PDS. While still a work in progress, this partnership has produced evidence of a significant improvement in student outcomes in reading, behavior, school attendance, and participation in after-school programs. In addition, the partnership has promoted professional development for teachers, technology integration in classrooms, and simultaneous renewal of the university and the school. A new emphasis on field-based learning for both preservice teachers and university teacher education faculty, supported through the integration of technology, enabled the members of the partnership to meet content and pedagogical needs and as a result enhanced the learning outcomes for middle school students.

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The Impact of Professional Development Activity on Student Reading Performance

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Two university faculty members were invited to join a meeting with faculty and a principal at a local school. An excerpt from their conversation follows:

> Principal: Our reading test scores are really down. A large percentage of our students are performing below grade level. I know our students can do better.
>
> Teacher A: It's hard when we have so many at-risk students, and I have to teach the curriculum in two grade levels. I need some help in teaching reading.
>
> Teacher B: I know our school would be better if we were consistent in our approaches to teaching, but I barely have time to think about what I'm doing much less what teachers in other grades are doing.
>
> Teacher C: I wish we knew how to assess our students along the way and not just at the end of the year when test scores come back. The pressure from the state end-of-grades tests is really getting to me.

The discussion revealed concerns about multiple grade levels in each teacher's classroom, the pressures created by the state accountability system, formative as well as summative assessment techniques, and the reading curriculum alignment. Following this meeting, the university faculty returned to campus to think about ways to help the school faculty address their needs. As the conversation evolved, issues for the university faculty also emerged.

> Professor A: Teachers today are under enormous stress with increased responsibilities and accountability. I knew this but had no idea how much this impacts what teachers do in the classroom. We've got to help them gain some control over these pressures.
>
> Professor B: I know the kind of reading assessments that might be helpful; in fact, I have been teaching our students how to conduct informal reading assessments and how to use the results to plan for instruction, but our students don't seem to value it. They just learn it to do well on my test. When they finally go out in the schools, they don't see these kinds of assessments used, and so they think that what they learn at the university has no real connection to schools. Our students can't wait to do their student teaching and learn how to "really teach." Yet practicing teachers are asking for this information. I wish our university students could see us working with teachers.
>
> Professor A: I wish I had more opportunity to work with children in schools, and I would like our university students to see that as well. I have some ideas

> about instructional strategies that I would like to try with children so that I can modify the strategies to better fit what students need. And I want to do this in front of our students so they can see the process of thinking as a teacher.

The discussion at the university revealed needs for university faculty to be aware of current issues and pressures in public school settings, for connections between university coursework and field experiences, and for university professors and teachers to work together in schools and in clinical teaching experiences with preservice teachers (Henderson, 1981; Morris, Ervin, & Conrad, 1996; Schön, 1987).

School and university faculty have concerns and needs, some unique and some shared. How can these two groups collaborate in a meaningful context to help one another address these complex issues? One way to collaborate and create a meaningful partnership is by establishing a professional development school (PDS). Since the Holmes Group (1990) began talking about the notion of PDSs, many universities and schools have created partnerships. This chapter describes the PDS work we have undertaken, its theoretical underpinnings, and the impact this work has had on our PDS and on K-6 students' learning.

Theoretical Framework

As school- and university-based faculty come together to solve problems, a PDS community of practice (CoP) is created that has the potential for improving the quality of teaching and learning in both public school and university settings. A theoretical perspective helps the collaborative relationship to achieve its potential by guiding PDS work and the complexities endemic to it.

Our work is based on a sociocultural paradigm (Chaiklin & Lave, 1996; Cole, 1996; Cole, Engeström, & Vasquez, 1997; Engeström, Miettinen, Punamaki, & Punamaki, 1999; Rogoff & Lave, 1999; Salomon, 1993a; Vygotsky, 1962, 1978; Wertsch, 1998; Wertsch, Del Rio, & Alvarez, 1995) because it allows for the creation of relations and activity that enrich the process of learning to teach. Salomon and Perkins (1998) describe learning from a sociocultural perspective as "a collective, participatory process of active knowledge construction that emphasizes context, interaction, and situatedness" (p. 2). The constructive nature of learning involves social processes that occur in cultural contexts (Salomon, 1993b). Learning viewed this way entails social mediation and a process of apprenticeship in which development is revealed in the "transformation of participation" (Rogoff, 1994, 1995). Rather than conceptualizing learning as a process of transmission from expert/teacher to novice/student, a sociocultural perspective emphasizes the social, collaborative, and reciprocal nature of learning, as well as the cultural tools that learners employ while participating in the socially relevant work activity of a group (Trathen & Moorman, 2001). These tools mediate learning and development (Cole & Engeström, 1993; Wertsch, 1985, 1991, 1998) as learners participate with more knowledgeable others in community activity. These activities take place in a CoP, where members share goals and a common language. Eventually, as learners gain experience, they move from peripheral to full participation in the CoP (Lave & Wenger, 1991; Wenger, 1998).

In this chapter, we use an activity system analysis based on sociocultural theory to document change in our PDS CoP and to reveal the contradictions and innovations in its activity system (Engeström, 1996). The first step in this analysis is to describe our PDS setting and the creation of our CoP.

Nature of Partnership

Our PDS is a collaborative effort between Beech Mountain School in Avery County, North Carolina, and the elementary education program in the Reich College of Education (RCOE) at Appalachian State University (ASU). Goals for our PDS include (a) establishing a long-term partnership between a K-6 school and the university; (b) improving the curriculum, instruction, and learning at both the university and school levels; and (c) documenting the resulting changes. These goals are consistent with the Holmes Group's definition of PDSs as schools created "for the development of novice professionals, for the continuing development of experienced professionals, and for the research and development of the teaching profession" (1990, p. 1).

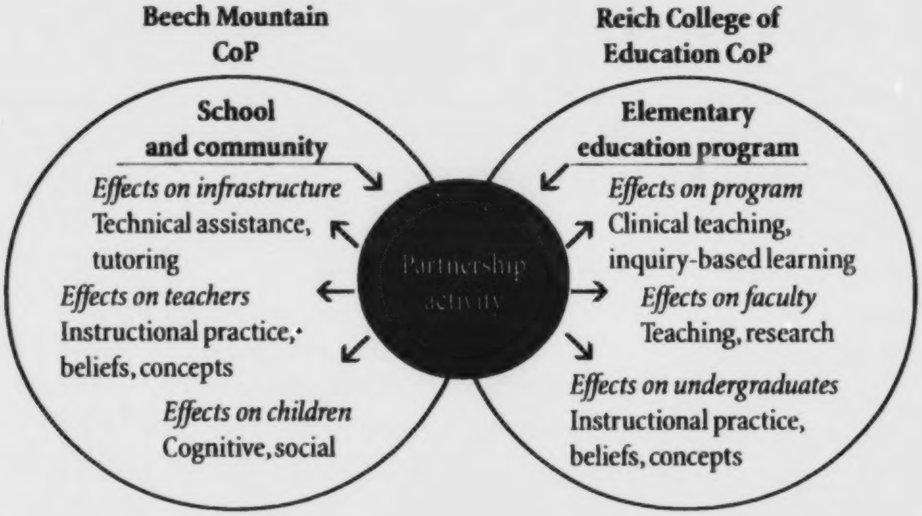
Our PDS comprises two distinct communities of practice: Beech Mountain School and the RCOE elementary education program. Our collaborative partnership joins the two CoPs through the coconstruction of shared goals and activity. The characteristics of Beech Mountain School and community as well as the characteristics of the ASU elementary education program shape the nature of the goals and activity created by the partnership. The shared activity in turn affects each of the CoPs. Figure 7.1 depicts our two communities of practice and the shared activity created by our partnership.

The School Partner

Beech Mountain School is located in the heart of the rural Appalachian Mountains, in northwestern North Carolina. At the time of this study, Beech Mountain was a K-8, Title I school that had 77 students from approximately 50 different families. Its population was below state averages for poverty and parental educational levels, and almost 75% of the students were eligible for free lunch. The staff consisted of four full-time classroom teachers, a Title I/special education teacher, and part-time teachers in art, dance, drama, physical education, music, media, and technology. Classes were multilevel by design and necessity because of the small number of students in each grade.

When we first visited Beech Mountain School, we were struck by how well the school functioned as a social organization. The parents were connected to the school, volunteers often helped when needed, the older students took care

Figure 7.1. Communities of Practice and Shared Activity Setting


Beech Mountain CoP
Reich College of Education CoP
School and community
Effects on infrastructure
Technical assistance, tutoring
Effects on teachers
Instructional practice, beliefs, concepts
Effects on children
Cognitive, social
Partnership activity
Elementary education program
Effects on program
Clinical teaching, inquiry-based learning
Effects on faculty
Teaching, research
Effects on undergraduates
Instructional practice, beliefs, concepts

of the younger students, and the faculty regularly interacted socially. However, the academic curriculum was fragmented, and the teachers were isolated, having little awareness of methods and materials used in other classrooms. Teachers rarely discussed teaching with one another, and faculty development primarily came in the form of district-sponsored workshops. No assessment other than the end-of-grade test was evident in the school curriculum. There was little attempt to integrate language arts skills into content instruction, and there was very little instruction in phonics or word study across the entire school.

The University Partner

ASU, one of the 16 campuses of the University of North Carolina system, is a regional, state university located in Boone, North Carolina, 18 miles from Beech Mountain School. ASU has approximately 12,500 undergraduate students. Each year, we graduate approximately 175 elementary education majors. In 1996-1997, faculty members at ASU began revisions of the elementary education program and were interested in piloting ways to better integrate meaningful field-based experiences with coursework. We recognized that a crucial component in preparing future teachers was the opportunity to spend significant amounts of time in schools, so we sought to create PDS settings where both university-based and school-based educators shared responsibility for our student interns (Darling-Hammond, 1994; Goodlad, 1994). In our pilot project, we developed PDS relations with three schools, including Beech Mountain School.

An analysis of our elementary teacher education program revealed a need to better align our curriculum with problems faced and practices used by the teachers who worked with our interns. Because our intern placements were spread out across an entire school district—it was not uncommon to have a single methods class (20 students) placed in five or six different schools—ASU faculty and teachers had little opportunity to work together. We also observed that our students were isolated with a single grade, classroom, and teacher. Rarely did they observe other teachers; they never observed one another teaching. Further, ASU students often did not see the relevance of the university class because they could not locate in the public school classrooms instructional practices they were learning at the university, even when many of these practices were being taught to local area teachers in faculty development conducted by the same ASU faculty. What seemed to be missing was the opportunity for our preservice teachers to observe the same instructional methods being used in both settings, to see ASU faculty work with teachers and students, and to practice teaching methods with K-6 students under the shared guidance of classroom teachers and ASU professors.

Shared Goals and Activity

In fall 1996, the Beech Mountain faculty contacted the RCOE to explore ways of working together to implement ideas from their school improvement plan. Two ASU faculty members, one from the Department of Language, Reading, and Exceptionalities and one from the Department of Curriculum and Instruction, agreed to collaborate with Beech Mountain faculty as they created their school improvement plan. The ASU faculty members also saw this potential partnership as an opportunity to develop meaningful field-based experiences for university students. All of the full-time teachers and the principal at Beech Mountain School participated in the collaborative endeavor, which increased the likelihood for successful change (Franke, Carpenter, Fennema, & Ansell, 1998).

Through a series of collaborative meetings, the number-one school priority that emerged was reading improvement. Discussion about reading curriculum alignment began; schoolwide assessments of student learning needs were developed; and professional development activities were planned. Consistent with the school focus on reading and ASU faculty's desire to create meaningful field-based experiences, we worked together to plan clinical practicum experiences (Morris, 1999b) for our university students.

As the PDS team worked to align curriculum and plan clinical practica, professional development naturally occurred as an extension. We used practical inquiry (Richardson, 1996) as a method to understand the curriculum change process. As a group, we identified an area to change, gathered relevant information, discussed ways to apply it, tried it out with students, discussed the results, and made needed modifications. These activities not only helped us study practice but also led to curriculum and teaching improvements and provided insights into our practice (Hubbard & Power, 1993; Oja & Smulyan, 1989; Stenhouse, 1975). This was an ongoing process and embodied many of the essential conditions for effective professional development (Hawley & Valli, 1999; Sykes, 1999; Wagner, 2001).

Methods

Two research questions frame our analysis: How can researchers evaluate the complexities of partnership activity? And what is the impact of the partnership activity on the PDS CoP system and on students' reading performance? This methods section describes the process by which we addressed the questions and is divided into two subsections. The first section describes methods for analyzing K-6 student learning, both at the school level and at the individual level. The second section describes methods for analyzing the activity system of our PDS CoP.

Student Performance Analyses

Student data consisted of formal and informal measures of students' reading performance used collectively for formative and summative evaluations. A combination of data from the standardized North Carolina end-of-grade (NCEOG) test and informal assessment procedures was used to evaluate student progress. Reading scores from the annual end-of-grade test were collected for each student in Grades 3 through 8. Additionally, at the beginning of each school year, the Title I teacher (assisted by classroom teachers and ASU faculty and students) assessed all students' (K-8) reading abilities using developmentally appropriate Word Recognition Inventory lists (Morris, 1989) and Informal Reading Inventories (Woods & Moe, 1981). Students' orthographic knowledge was assessed using a developmentally constructed spelling assessment instrument (Schlagal, 1992, 1996). Table 7.1 provides a summary of the informal measures of students' reading performance.

The combination of these instruments gave us five proven measures of reading performance, measures that could be used to indicate students' instructional levels and track performance in reading and word study. Comparisons of trends across time allowed us to measure the impact of our PDS activity on students' reading performance.

Activity System Analysis

Sociocultural researchers have proposed that activity is the appropriate unit of analysis (Blanton, Moorman, & Trathen, 1998; Brown, Ash, Rutherford, Nakagawa, Gordon, & Campione, 1993; Lave, 1996; Moll, Tapia, & Whitmore, 1993; Vygotsky, 1978; Wertsch, 1995). In this study, we documented observed activity in our CoP and recorded system-level change. We kept field notes of partnership activity and participant reactions, and we used content analysis and qualitative methods to determine themes in field notes and archived arti-

Table 7.1. Informal Reading Assessment Instruments

Instrument	Description
Word Recognition Inventory	This inventory consists of grade-level lists of 20 words per list ranging preprimer to eighth grade. The words are flashed to a student for a measure of immediate sight-word recognition.
Qualitative Inventory of Word Knowledge[1]	This inventory consists of developmentally organized lists of words that correspond to grade levels. Students are asked to write dictated words from the inventory, and spelling is scored for correctness.
Informal Reading Inventory Oral reading accuracy Oral reading rate Reading comprehension	This inventory consists of grade-level passages that students read aloud. The instrument yields three scores: reading accuracy, rate, and comprehension.

[1] For more information on developmental spelling see: Bear, Invernizzi, Templeton, & Johnston, 2000; Ganske, 2000; Henderson, 1981, 1990; Henderson & Beers, 1980; Morris, Blanton, Blanton, Nowacek, & Perney, 1995; Morris, Blanton, Blanton, & Perney, 1995; Morris, Nelson, & Perney, 1986; Read, 1975; Schlagal, 1982, 1992, 2001; Templeton & Bear, 1992; Templeton & Morris, 2000.

facts (Covert, 1977; Lincoln & Guba, 1985). This analysis was used to establish linkages between partnership activities and student outcomes.

Student Reading Performance

Student performance in reading was captured through formal and informal reading and spelling measures. These data were aggregated and reported at a school level. In addition, a single case of a struggling reader was examined for change in reading performance across a 3-year span.

Student growth in reading was reflected in gains in the North Carolina end-of-grade test scores as well as in gains on informal diagnostic assessments. Our collaboration began in spring 1997, and in every subsequent year, school composite scores improved. In 1997-1998, 76.3% of the students in Grades 3 through 8 scored on or above grade level on the end-of-grade test. In 1998-1999, the percentage climbed to 83.8%, and Beech Mountain was a "Top 25" school in the state as well as a "school of distinction." In 1999-2000, 90.5% of the students scored on or above grade level, and Beech Mountain was recognized as 1 of just 25 Title I Distinguished Schools throughout the United States during the 2000 International Reading Association annual meeting. The school also received an award for educational excellence from the North Carolina Department of Public Instruction.

Results from informal reading assessments collected in 2000 revealed that 95% of students who scored at least two levels below grade achieved at least 1 year's growth, and 58% of those students achieved greater than 1 year's growth. Longitudinal comparisons of data revealed patterns of significant improvement in student reading performance. A school that once had the lowest reading scores in the school district now had the highest. Anecdotally, the teachers and principal attributed these positive changes to the PDS efforts.

Making the Link Through Case Analysis

One goal of our collaboration was to increase the effectiveness of the reading curriculum across the entire school but especially for low-performing students. When we began the PDS with Beech Mountain, many of the children in the school were reading below grade level, some of them as many as 3 years behind. To illustrate a link between PDS activity and improved student performance, we selected a low-performing student, "Angela" (a pseudonym), to follow using a case study approach (Morris et al., 1996) comparing results from informal reading measures across 3 years. Angela's case represents many of the lowest performing students at Beech Mountain School.

For students like Angela, we arranged a double dose of reading instruction—some with the Title I reading teacher and some in small groups in class. We made use of the extra attention provided by the ASU interns as they worked with students one-on-one and in small groups. We made every effort to coordinate the reading and word study in class with the Title I pullout instruction. We encouraged the classroom teachers to level materials, create small reading groups, and match the materials to students' developmental levels—procedures also used in Title I instruction. Students discussed and wrote about books they read, and they were encouraged to read many books at their independent and instructional levels. We also introduced the technique of timed repeated readings (Morris et al., 1996; Samuels, 1979) to the Title I and classroom teachers. In this procedure, a student reads a familiar passage for 3 minutes, and the number of words the student reads is graphed. The next lesson, the student reads from the same passage again, and then a third time the following lesson. Each time, the number of words the student reads is added to the graph. After three trials, a new book is read in this 3-time cycle and graphed. Angela's scores increased—as they did for other students—from the first to the third time for each book, and her scores gradually increased across the number of books read. We used this technique to increase reading fluency.

On the reading and spelling assessments for April 1999, when Angela was about to finish third grade, her scores revealed that she lacked sight-word vocabulary to read past first grade, as was evident by her drop in second-grade-level scores for flash, accuracy, comprehension, rate, and spelling. Her reading was slow, strained, and barely audible. She lacked confidence in her ability to read and avoided reading when she could (see Table 7.2).

Table 7.2. Angela's Test Results Across 3 Years: Word Recognition, Passage Reading, and Spelling

	Word recognition		Passage reading (oral)			Spelling
Grade level	Flash %	Untimed %	Accuracy %	Comp. %	Rate (wmp)	%
April 1999 (Angela is a third-grade student barely reading on a first-grade level.)						
Primer	75	80	96	100	83	—
First	55	75	90	80	79	40
Second	25	30	68	40	45	0
March 2000 (Angela is a fourth-grade student solidly reading on a second-grade level.)						
Primer	90	100	100	100	115	—
First	85	90	93	100	77	90
Second	55	70	90	80	70	60
Third	30	35	88	100	63	20
February 2001 (Angela is a fifth-grade student reading on a fourth-grade level. This is a mid-year assessment.)						
Primer	100	100	100	100	142	—
First	95	100	99	100	123	100
Second	85	100	96	80	97	80
Third	75	85	94	100	92	50
Fourth	50	65	95	100	98	30
Fifth	30	50	85	86	73	10

Note. Instructional level criteria (%) varies by assessment task: word recognition (flash) 60%, oral reading accuracy 92%, reading comprehension 70%, and spelling 40%. Expected reading rates (words per minute) vary by grade level of the material: first, 30-70 wpm; second, 60-90 wpm; third, 80-110 wpm; fourth, 95-120 wpm; fifth, 110-140 wpm. See Morris (1999a) for a more detailed description of the use and interpretation of these instruments.

The following year, Angela worked with the Title I teacher on timed repeated readings, word study, and guided reading lessons. She also participated in guided reading lessons in class with a small group that was reading material at second- and third-grade levels. Angela's test results from March 2000 (near the end of fourth grade) demonstrated that she was reading and spelling solidly on a second-grade level. This gain represented 1 year's growth for her. Angela's basic skills had begun to solidify, and her fluency showed signs of increasing, but she was still two grade levels behind.

Angela's fifth-grade teacher used literature circle lessons with small groups that were reading books on instructional levels. Angela struggled to participate at first, because even the lowest level material was developmentally difficult for her. We asked the Title I teacher to use Angela's literature circle material in the pullout sessions, allowing the student to read her material twice. This strategy enabled Angela to participate in the rich discussion of books, and the repeated reading was building fluency and confidence. February 2001 assessments (middle of fifth grade) showed Angela had improved to a fourth-grade level. She had made 2 years' growth, and there was still time left in the year. Angela's gains were noticeable to everybody, especially to herself. Her confidence, pride, and interest in reading increased tremendously. A girl who a year before was embarrassed and hated to read aloud would now come up to us when we visited the school and ask if she could read to us!

Making the Link Through System Analysis

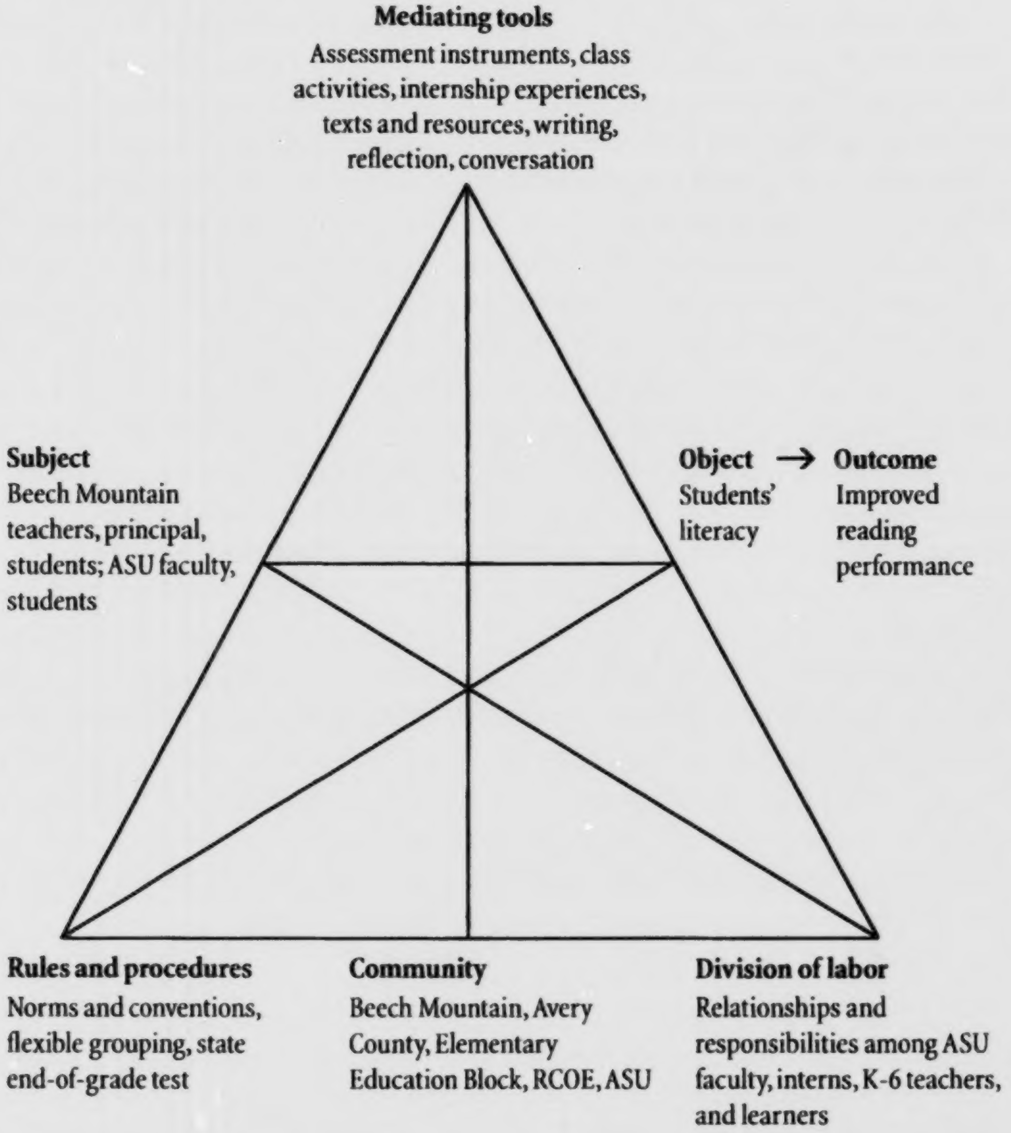
To better understand the link between our PDS work and the growth in student performances that resulted, we used Engeström's (1996) systems analysis to capture changes to our PDS CoP. (See Figure 7.2 for a summary of the activity analysis used on our CoP.) We compared elements of the activity system when we first began working with Beech Mountain School with those elements 3 years later. We also identified contradictions in our activity system that impact our PDS CoP.

The focus of our activity system analysis was the group (*subject*) that participated in the shared activity of our PDS CoP: Beech Mountain teachers, principal, and students and ASU faculty and students. We analyzed the setting (*community*) for our PDS and documented roles and responsibilities (*division of labor*) within the activity. The shared activity was directed toward improving Beech Mountain students' literacy (*object*) with the expectation that their reading performance would improve (*outcome*). We analyzed what was used in the activity (*mediating tools*) to improve students' reading performance, and we documented procedures and conventions (*rules and procedures*) associated with our PDS CoP.

Three years later, our PDS CoP showed evidence of systemic change. At Beech Mountain School, there was evidence that the content of the reading and language arts curriculum had been aligned across the grades. Teachers talked with each other about materials and methods. They used a variety of assessment techniques to determine students' instructional needs, and flexible, dynamic grouping was enabled by leveling all reading materials. A variety of materials and teaching strategies were used in one-on-one, small-group, and whole-class configurations. Teachers were forming small instructional groups based on assessment techniques, and attention was paid to pacing to ensure that students were working on the appropriate instructional levels where maximum growth could occur. Students' performance and growth were monitored; when students were ready to advance, they were moved to the appropriate group.

A comprehensive developmental word-study program was designed and implemented in Grades 2 through 8, and teachers learned about developmentally appropriate spelling instruction (Invernizzi, Abouzeid, & Gill, 1994). Students were placed in groups consistent with their developmental understanding

Figure 7.2. Partnership Activity System


Mediating tools
Assessment instruments, class activities, internship experiences, texts and resources, writing, reflection, conversation
Subject
Beech Mountain teachers, principal, students; ASU faculty, students
Object → Outcome
Students' literacy
Improved reading performance
Rules and procedures
Norms and conventions, flexible grouping, state end-of-grade test
Community
Beech Mountain, Avery County, Elementary Education Block, RCOE, ASU
Division of labor
Relationships and responsibilities among ASU faculty, interns, K-6 teachers, and learners

of English orthography, determined by their performance on the developmental spelling instrument teachers were taught to administer. As with instructional reading groups, students' performance and growth were monitored to determine when students were ready to advance.

Our elementary education CoP changed in a number of ways also. ASU interns were assigned to a school rather than to a random classroom somewhere in the school district. The interns were placed two to a classroom to be able to observe one another teaching and reflect with each other about their experiences. As a result, they shared an understanding of the various teaching contexts that existed in our PDS, were more inclined to visit other classrooms and participate in school-level activities, and reported feeling part of the school faculty. The ASU faculty was associated more closely with the PDSs, and ASU students were able to see faculty work with PDS teachers and students. Most important, changes at Beech Mountain School made it possible to align the methods curriculum with school practices. ASU students learned techniques in class that they then saw being used in the PDS; they also had the chance to practice teaching and discuss the experiences with ASU faculty and PDS teachers. In short, we were able to create clinical teaching experiences for our ASU students.

To summarize, we found changes in the roles and responsibilities of the subjects, the mediating tools, and the rules and procedures of our PDS activity. Coinciding with these changes, we documented improvement in Beech Mountain students' reading performance, which suggested a link between our PDS activity and student outcomes. Additionally, we documented a number of contradictions in our activity system, such as with the state-mandated end-of-grade testing: Beech Mountain students took end-of-grade tests that required them to read material on grade level although many students were reading developmentally below grade level. While we were encouraging teachers and interns to match materials to students' abilities, the state was ignoring this issue in its testing practices. As a result of this contradiction, we had to convince teachers that they could better impact grade-level reading by having students who were reading below grade level read material matched to their abilities, regardless of how the state tested.

We found Engeström's (1996) systems-level analysis to be very helpful in conceptualizing the complexity of our PDS activity system and in documenting the impact of our PDS activity on student performance. We continue to use this analysis as we engage in PDS work and attempt to improve our practice.

Implications

Implications from our PDS work contribute to thinking about evaluating the impact of PDS work on two levels within an individual partnership: the student performance level and the system level. Certainly, there are aspects of our work that could be used by educators working to improve reading performance in schools. We have identified three critical components to improving students' literacy: schoolwide assessment of student learning needs, schoolwide curriculum development and alignment, and schoolwide professional development.

Schoolwide assessment of student learning needs using a combination of formal and informal assessment procedures is critical to the improvement of students' literacy. Informal assessments that have proven to be effective include Word Recognition Inventories (Morris, 1989), developmental spelling assessments, and Informal Reading Inventories (Woods & Moe, 1981). Results from these assessments can be analyzed and used to make curriculum and instructional decisions. Careful analysis of student growth over time using a case study approach also can contribute to our understanding about the impact of PDS work on student learning.

Schoolwide curriculum development and alignment include building a common perspective about reading instruction. An important feature is agreement to match instruction to students' reading levels. These kinds of schoolwide curriculum changes have to be supported with continuous, in-depth professional development that grows out of needs identified by school personnel. More important, our research reveals that to have significant impact on student learning, all participants in the collaboration must make a long-term commitment, and the ways in which the collaborative partners work must be carefully structured.

PDS work is dynamic and developmental, involves layers of complexity, entails collaborations involving multiple perspectives and people, and requires that the PDS work be assessed across time. These characteristics argue for a different type of evaluation. Engeström (1996) offers a model to use in developmental work research that looks at the entire activity system and is not specific to a particular discipline. The aim is to produce conceptual tools that help participants understand complexity within a given system.

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Implementing an Outcomes-Based Collaborative Partnership for Preventing Reading Failure

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Although a national goal is to have all students reading independently and well by Grade 3 (Clinton, 1997; No Child Left Behind Act of 2001), rural schools often lack the resources and access to effective professional development to prevent reading difficulties in the early grades. One solution to this dilemma is a school-university partnership.

Concerned about the declining reading achievement among students in the early grades and wanting to better connect research with practice regarding early reading instruction, a Midwestern rural school engaged the nearby university to focus on the problem. Thus began a school-university partnership with the purpose of improving students' reading achievement by the end of Grade 3 and reducing the number of students demonstrating reading difficulties. To achieve these goals, the teachers, principal, and university professors focused on professional development and research in effective reading instruction for students at risk of reading failure. All involved wanted the effects of the partnership to sustain beyond their initial efforts.

The school and university participants based the partnership on collaboration as defined by Friend and Cook (1996). All shared a common goal (improving reading achievement), resources, responsibility for participation and decision making, and accountability for the outcomes. While school and university personnel differed in areas and levels of expertise, the contribution of each was valued, and each participant had equal decision-making power that resulted in improved reading achievement in kindergarten through Grade 3.

The Partnership and the Partners

At the school level, the partnership involved the principal and all teaching personnel in kindergarten through Grade 3. The principal served as a "reading leader" and participated in professional development as time allowed, scheduled the school day to facilitate uninterrupted reading instruction, asked questions whenever she needed additional information, and observed and provided supervisory feedback to the teachers. During Year 2, the principal entered data from the ongoing student assessments and graphed the reading progress of the at-risk students.

The kindergarten teacher, the two teachers from each grade level from 1 to 3, the special education teacher for Grades 1 through 3, the pullout reading teacher, and a paraprofessional were directly involved in the partnership activities. They were in various points of their careers, and five of the teachers had master's degrees, but all wanted to improve their teaching skills in the area of reading. The teachers participated in and determined the content and format for after-school and summer professional development, analyzed student data, and consistently intensified their reading instruction to meet the needs of their students.

Two university professors contributed their knowledge of effective professional development and research-based instruction for students at risk of reading failure. The professors provided time, materials, coaching, and professional development activities. The college of education provided tuition for coursework for the teachers, a graduate assistant, students to administer assessments (with stipends for their travel expenses), data input and graphing, and secretarial support, including photocopying. Even parents were involved by volunteering to receive training and work with students to improve their reading fluency.

Although the district superintendent supported the partnership and provided funds for a paraprofessional and instructional materials, when the partnership first formed, the principal, teachers, and professors committed time and resources without outside funding. Eventually, the university professors received an Eisenhower Professional Development grant for reading improvement. The grant provided funds for a one-course release for 2 semesters, allowing one of the professors to devote more time to the partnership for on-site assistance. The grant also funded reading materials for the students and small stipends for the teachers for the extra time they were involved in partnership activities.

The primarily White student population (less than 5% were Latino and 1% Black) was of lower-middle and middle socioeconomic status. Cohort 1 (41 students) entered in the fall of the 1st year of the partnership when they were in first grade. Cohort 2 (32 students) was involved in partnership activities in the winter of the 1st year, when they were in kindergarten. Cohorts 3 and 4 entered in the winter of their kindergarten year, during the 2nd and 3rd year of the partnership. This chapter reports only the data for Cohorts 1 and 2.

Partnership Activities

During the formative stages of the partnership, the kindergarten and first-grade teachers indicated that they needed help in meeting the needs of their students at risk of reading failure. The principal, K-3 teachers, and their university partners agreed that reading instruction for the students would be based on the available research about reading instruction. Teacher input also played a large

Table 8.1. Convergent Research Related to Preventing Reading Failure

Instructional component	Research evidence
Phonemic awareness	Instruction, particularly in segmenting and blending, facilitates reading acquisition of all students (e.g., Byrne & Fielding-Barnsley, 1989, 1993; Lie, 1991; Lundberg, Frost, & Peterson, 1988).
Letter/sound correspondences	Explicit instruction facilitates reading acquisition (National Reading Panel, 2000; Snow, Burns, & Griffin, 1998). Explicit instruction integrated with phonemic awareness facilitates reading acquisition (Lyon, 1998; O'Connor, Jenkins, & Slocum, 1995; Stanovich, 1994).
Oral reading fluency and comprehension	Student fluency strongly correlates with reading comprehension (Deno & Markell, 1997; Shinn, Good, Knutson, Tilly, & Collins, 1992). Larger rather than smaller gains reliably predict increases in literal comprehension (Deno & Markell, 1997). Reading fluency instruction and assisted practice facilitate improved reading and reading comprehension (Chard, Tyler, & Vaughn, 2002; Kuhn & Stahl, 2000).
Comprehension	Instruction in a variety of reading comprehension strategies generally improves reading comprehension (National Reading Panel, 2000). Explicit, scaffolded instruction improves the reading comprehension of struggling readers (Dickson, Collins, Simmons, & Kame'enui, 1998).
Written expression and spelling	Reading should be integrated with instruction in written expression and spelling (Snow, Burns, & Griffin, 1998).

part in developing partnership activities. The teachers were surveyed and reported that they had some knowledge and skills in implementing instruction for students who demonstrated poor reading achievement and in teaching comprehension strategies, but they requested assistance in identifying students who required extra practice or more intensive instruction in beginning reading or other skills. The teachers also requested help in improving their instruction for these students.

The partnership incorporated research-based components of reading instruction (see Table 8.1) and research-based professional development strategies that were teacher friendly. The strategies addressed teachers' perceived needs (Goldenberg & Gallimore, 1991), merged new ideas with what already worked for teachers (Gersten & Woodward, 1990; Mauloff & Schiller, 1995), linked changes in teaching to students' learning (Gersten & Brengelman, 1996), targeted skills that were easy to implement considering the realities of the teach-

Table 8.2. Times, Formats, Participants, and Content for Teachers' Professional Development

When	Format	Who	Content
Year 1, beginning of each semester	1-day workshops	Kindergarten, Grade 1, Tier 2 teacher	Instruction in phonological awareness and letter/sound correspondences; assessment to identify students at risk
Year 1	Training provided by Wilson Language System	Tier 2 teacher	Wilson Reading System
Year 2	Monthly workshops for 1.5 hours after school, followed by observations with feedback	Kindergarten, Grades 1 & 2, Tier 2 teacher	Components of reading instruction
Summer between Years 2 and 3	1-week seminar	All teachers	Components of reading instruction, alignment Tier 1 and Tier 2, decodable text, grouping for reading instruction
Year 3	Monthly workshops for 1.5 hours after school followed by observations with feedback	All teachers	Features of effective instruction in reading fluency, spelling, and reading comprehension

ers' classrooms (Baker & Smith, 1999; Richardson, 1991), and provided teachers with extensive practice with a coach and specific feedback (Gersten & Woodward, 1990).

To help teachers merge the new teaching ideas with what already worked for them, the partnership provided scaffolding for the teachers. New instructional approaches (see Table 8.2) related to reading strategies and effective instruction were modeled by professors and experienced teachers. Following the modeling, the teachers had opportunities to practice and discuss the new strategies. Coached practice and feedback occurred in two ways. During workshops, teachers practiced the new skill and received feedback from the professors. Additionally, the university partners observed each teacher's targeted instructional techniques and gave the teacher specific feedback.

The partners not only collaborated to provide professional development for the teachers but also implemented a three-tier model for reading instruction. The three-tier model is based on the principle that the acquisition of reading skills can be placed along a continuum from least to greatest instructional needs (Dickson & Bursuck, 1999; Lyon & Moats, 1997; O'Connor, Notari-Syverson, & Vadasy, 1998). The degree of intensity (Torgesen & Davis, 1996), explicitness, systematic instructional design, teacher supports, integration with other skills, modeling of skills or strategies, and review vary according to the learners' skills and diverse learning needs (e.g., Simmons & Kame'enui, 1998). Tier 1 was the classroom instruction for typical readers; Tier 2 provided intensive small-group instruction in a pullout model delivered by an additional reading teacher; and Tier 3 provided reading instruction through special education.

Ongoing monitoring of progress according to achievement criteria for each tier of instruction allowed students to move between tiers based on their evolving needs. During the 1st year of the project, university undergraduates pretested and screened the students and monitored their progress. Measures were chosen that would identify students at risk of reading difficulties, serve as a pretest, monitor student progress in reading, and/or serve to evaluate final outcomes (as a posttest). For the 2nd semester of kindergarten, the measures included rapid letter naming (Kaminski & Good, 1996) and segmenting fluency (Kaminski & Good). The segmenting fluency measure was used to monitor student progress. For students in the 1st semester of Grade 1, assessments measured segmenting fluency, nonsense-word reading fluency, and rapid letter naming. The segmenting and nonsense-word fluency measures were used to track students' progress. For the 2nd semester of Grade 1 through Grade 3, oral reading fluency was measured. Gradually, the teachers took more and more responsibility for assessing their students, and by the 3rd year of the project, teachers administered the pretests, screening measures, and posttests, and the school took over full responsibility for monitoring the progress of the students. Table 8.3 lists the screening and monitoring measures and their technical adequacy.

Workshops, observations, implementation of new skills, and monitoring the results required intensive collaboration between the university and the teachers. Often the results of monitoring the progress of students would result in changes in instruction. For example, during one summer workshop, the first-grade teachers decided to include small reading groups in their classrooms and developed ways to introduce their new teaching strategies during small-group time. Teachers and professors searched for more books appropriate for the struggling readers, and a university professor analyzed the passages and books to sequence them in a manner that was appropriate for the word-analysis strategies the teachers were implementing. This group effort supported the teachers' use of new strategies. With newly identified needs, new ideas about teaching,

Table 8.3. Screening and Monitoring Measures and Their Technical Adequacy

Measure	Validity	Reliability
Rapid letter naming component of the *Dynamic Indicators of Basic Early Literacy Skills* (DIBELS) (Kaminski & Good, 1996)	Concurrent criterion-related with the *Standard Diagnostic Reading Test* (.50) and oral reading fluency (.45)	Alternate form (.83 for first grade, Spearman-Brown Prophecy formula)
Segmenting Fluency component of DIBELS (Kaminski & Good, 1996)		Alternate form (.60 Spearman-Brown Prophecy formula)
Nonsense-word fluency component of DIBELS (Good, personal communication, August 3, 1998)	Criterion reliability with curriculum-based reading measures (.80)	Alternate form (high .80s)
Test of Oral Reading Fluency (Children's Educational Services, 1987)	Coefficient with *Stanford Diagnostic Reading Test*, *Woodcock Reading Mastery Test-Revised*, and *Peabody Individual Achievement Test* (.52-.91)	Alternate form (.97)

direct feedback, and support to use student data to plan for teaching, the instruction began to change.

Measuring Success in the Partnership

As in many partnerships, measuring classroom practice was difficult due to voiced concerns of teachers and time restraints on the professors. However, the direct measurement of students' outcomes or learning constituted a critical part of the professional development effort. Research indicates that the likelihood of teachers continuing to use an innovative practice is enhanced when it can be shown that the innovations help difficult-to-teach students learn (Gersten & Brengelman, 1996; Gersten, Carnine, Zoref, & Cronin, 1986; Sparks, 1988). Because the major goal of the partnership was to decrease the number of problem readers, measuring the partnership's success required measuring students' reading achievement. The partnership focused on making key instructional decisions related to the model for reading improvement (i.e., identifying and monitoring the progress of at-risk readers) that were data based and therefore could only be accomplished through the measurement of student learning. Throughout the 3 years, data were shared immediately, and partnership activities were guided by discussion and reaction to the data. Box 8.1 and Figure 8.1 provide a detailed description of how data were used by teachers in the project.

Data collected to measure the impact of partnership activities included teacher interviews and surveys to determine needs, feedback from teachers after each workshop to identify the strategies they intended to implement and skills they wanted to learn, classroom observations, and an exit interview. The impact of the partnership on students was gauged using the measures that served as a pretest, monitored student progress in reading, and evaluated final outcomes. Student outcomes were measured frequently and throughout the partnership. Their data served as a benchmark for the success of changes in reading instruction and contributed to increased collaboration and sustainability of the implementations.

Teacher and Student Outcomes

In kindergarten, the systematic identification of at-risk readers led to a more comprehensive integration of reading skills instruction in the kindergarten curriculum. For the first-grade teachers, systematic early identification led to the realization that while their literature-based program was effective for many of the students, other students required a different approach. This recognition changed not only their classroom practice but that of the Tier 2 teacher as well. As a result of partnership activities, varying levels of intensity of reading instruction were available to students as needed and dependent on their performance on the various measures.

First-grade teachers moved away from exclusive use of large-group reading instruction and began to conduct small-group, skill-oriented instruction with students who needed a more direct teaching approach. Classroom teachers also made certain that the books selected by at-risk readers were coordinated with the skill sequence in their Tier 2 reading program. For second- and third-grade teachers, an oral reading fluency assessment became a part of classroom procedures. The collection of these data resulted in teachers' use of small-group reading instruction for students needing extra skill instruction as well as reading fluency building.

Two types of student outcomes indicated the impact of partnership activities: (a) comparisons between Tier 1 and Tier 2 and (b) student movement between the tiers. Means, standard deviations, and student gains in three measures for Tier 2 students as compared to their classmates in Tier 1 are shown in Tables 8.4 and 8.5. One group of students, the "Exit Tier 2" group, exited Tier 2 by meeting the exit criterion of performing at the 50th percentile in oral reading fluency for their grade level. In Cohort 1, the data are reported separately for students who exited Tier 2 during Grade 2 and students who exited Tier 2 during Grade 3. In Grade 3, data continue to be reported separately, because it is important to note that the students who exited Tier 2 during Grade 2 contin-

Box 8.1. The Use of Data for Instructional Decision Making

Screening to identify first- through third-grade students for reading difficulties occurred in the early fall and for kindergarten in January. For kindergarten and Grade 1, we established cutoff scores for the various reading measures using districtwide data. For Grades 2 and 3, we used the oral reading fluency scores that Hasbrouck and Tindal (1992) based on data from several studies. Students in kindergarten through Grade 3 who scored in the bottom quartile on any reading measure were identified for Tier 2. For Grade 1, scores in the bottom quartile on measures of letter-naming fluency and segmenting proved a particularly robust indicator of future reading problems (Wagner et al., 1997). Students were grouped by reading strengths and needs in Tier 2 following an analysis of their performance on the various measures.

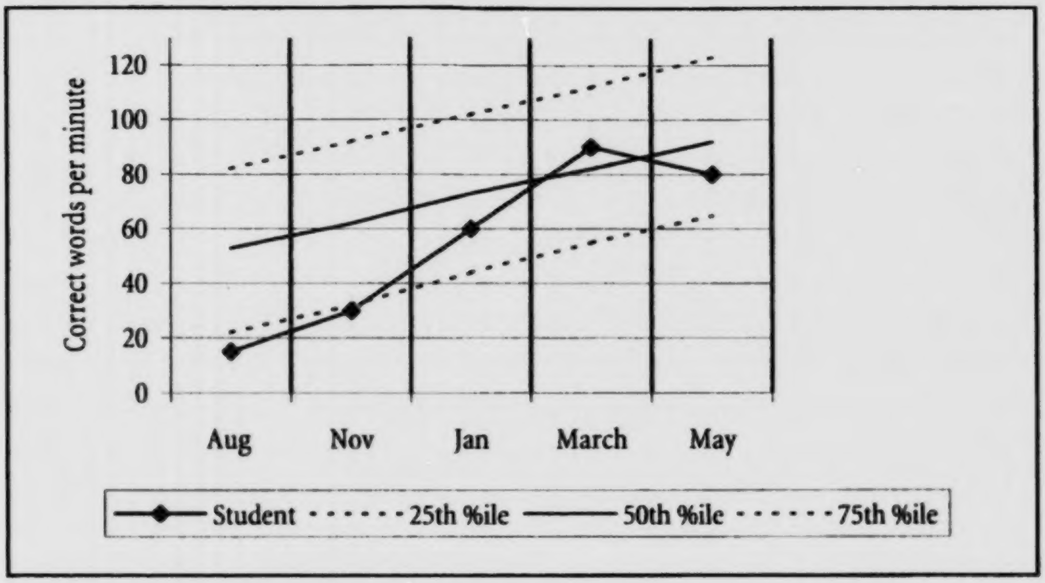
Teachers provided additional input about whether students who scored in the bottom quartiles or other low-scoring students should receive Tier 2 instruction. Additionally, as the school year progressed, teachers moved students who responded poorly to classroom (Tier 1) instruction into Tier 2 instruction.

The reading progress of students in Tier 2 was monitored every 3 weeks using grade-level passages (Children's Educational Services, 1987). We established goals for individual students based on reaching the 50th percentile scores for their grade level by the end of the school year. We created an individual graph for each student for the school year. For the fall, the graph showed the student's initial oral reading fluency; for the spring, the graph showed the student's goal. We connected the two points with an aim line that indicated the progress the student needed to make across the school year in order to reach the goal by spring. We graphed all progress monitoring data and compared the data with the student's aim line (see Figure 8.1). We shared all graphs with the Tier 2 and classroom teachers. Data served three purposes: (a) to revise Tier 2 instruction for students who did not demonstrate adequate progress as shown on the graphs, (b) to exit students from Tier 2 to either Tier 1 or Tier 3, and (c) to monitor students who had moved to Tier 1 in order to get immediate help for them if they failed to remain successful. Students who reached their goal exited to Tier 1; students who consistently demonstrated little or no progress despite increased intensity in Tier 2 instruction were referred for evaluation for special education.

The progress-monitoring graph shown in Figure 8.1 was the result of collaboration between the Grades 2 and 3 teachers and the professors. The graph shows progress in Grade 2 oral reading fluency. The solid line represents student performance at the 50th percentile across the school year. The dotted lines correspond to reading performance at the 25th and 75th percentiles. For the student represented on this graph, the August score was 15 correct words per minute—a score that is below the 25th percentile, making him eligible for Tier 2 instruction. Note that while this student makes progress, he fails to reach the 50th percentile for 2 consecutive assessment periods. Pending his performance on the fall screening in Grade 3, this student will remain in Tier 2 during Grade 3. Because this student made little progress from August to November, his Tier 2 instruction was intensified. If the student had continued showing little progress, he would have been considered for evaluation for special education.

ued their gains in reading achievement while receiving regular classroom instruction in second and third grades. The students who exited Tier 2 during Grade 3 required longer intensive instruction and did not reach the achievement levels of the other students in Grade 3. The other group, "New Tier 2," was

Figure 8.1. Sample Progress-Monitoring Graph for Second-Grade Oral Reading Fluency



students who started in Tier 1 but whose poor performance indicated that they required the more intensive instruction of Tier 2.

Student gains from pretest to posttest are reported as the quotient of the gain in raw scored divided by the standard deviation for the pretest for Tier 1 (S. Baker, personal communication, March 14, 2001; S. Seidner, personal communication, November 5, 2001). This quotient or relative growth index is a good indicator of the extent to which Tier 2 students are catching up with their classroom peers. The higher the quotient, as compared to their peers, the greater the rate of catch-up. For example, the performance of students in Cohort 1 on the skill of segmenting (see Table 8.4) shows that the Tier 2 students make a gain in segmenting of 1.13 standard deviations as compared to the gain of .14 standard deviation exhibited by their peers. Thus, for segmenting, students in Tier 2 narrowed the gap between themselves and their typically performing peers in Tier 1. For oral reading fluency, the students who continued in Tier 2 from kindergarten into Grade 1 made gains equal to or slightly better than their typically performing peers in Tier 1. In Grades 2 and 3, the students in Tier 2 demonstrated greater gains than their peers in Tier 1, narrowing the gap between themselves and their peers, but still not reaching the mean oral reading fluency of their peers. In general, data from Cohorts 1 and 2 show that overall Tier 2 instruction was effective in helping close the gap between at-risk students and their general education classmates.

Movement between the tiers also indicated the success of partnership activities. Frequent progress monitoring facilitated movement between the tiers of instruction. Student movement between the tiers is shown in Figures 8.2 and

Table 8.4. Mean Performance Scores of Cohort 1

	Segmenting[d]			Nonsense word[d]	Oral reading fluency[e]		
	Pretest	Posttest	Gain in SD of Tier 1	Posttest[c]	Pretest	Posttest	Gain in SD of Tier 1
Grade 1							
Tier 1	35.1	36.8	0.14	49.7		80.1	
(n = 26)	(12.0)	(9.4)		(15.0)		(31.7)	
Tier 2	20.5	34.0	1.13	42.7		36.6	
(n = 15)	(11.8)	(11.5)		(12.9)		(17.2)	
Grade 2							
Tier 1					82.7	116.6	1.04
(n = 26)					(32.6)	(25.4)	
Exit Tier 2					57.5	99.8	1.30
(n = 6)					(15.8)	(18.1)	
Tier 2					26.7	73.5	1.44
[a](n = 3)					(6.8)	(12.6)	
Grade 3							
Tier 1					100.6	138.5	1.51
(n = 26)					(25.2)	(25.0)	
Exit Tier 2 in Grade 2					94.0	141.6	1.89
(n = 4)					(22.3)	(21.6)	
Tier 2					51.0	101.0	1.98
[b](n = 4)					(11.2)	(10.6)	
Exit Tier 2 in Grade 3 (n = 1)					59.0	107.0	2.15

[a] Two moved to Tier 3; four moved out of the school. [b] Two who had exited in Grade 2 moved back into Tier 2; one exited to Tier 1; two remained from Grade 1. [c] No pretest given. [d] Data not applicable in Grades 2 and 3. [e] Data not applicable in fall and winter of Grade 1.

Table 8.5. Mean Performance Scores of Cohort 2

	Segmenting[c]			Nonsense word fluency[d]			Oral reading fluency[e]		
	Pretest	Posttest	Gain in SD of Tier 1	Pretest	Posttest	Gain in SD of Tier 1	Pretest	Posttest	Gain in SD of Tier 1
Kindergarten									
Tier 1 (n=20)	42.6 (6.1)	45.7 (5.7)	0.51						
Tier 2 (n=12)	19.4 (14.0)	35.0 (14.7)	2.56						
Grade 1									
Tier 1 (n=14)	45.6 (17.7)	52.8 (14.0)	0.41	33.7 (20.1)	82.8 (33.7)	2.44	67.3 (37.7)	102.6 (34.8)	0.95
Exit Tier 2 (n=3)	28.6 (21.2)	38.3 (10.5)	0.55	28.0 (19.2)	58.0 (38.0)	1.49	52.7 (38.4)	98.0 (38.7)	1.20
Tier 2 (n=9)	24.9 (16.4)	58.9 (16.6)	0.79	8.9 (6.6)	65.0 (19.7)	2.94	16.3 (4.6)	54.0 (15.7)	0.95
New to Tier 2 (n=6)	12.3 (11.3)	64.2 (10.7)	2.90	10.8 (7.4)	56.4 (22.3)	2.27	17.0 (11.0	44.3 (18.9)	0.72
Grade 2									
Tier 1 (n = 14)							99.1 (36.1)	129.0 (37.3)	0.83
Exit Tier 2 in grade 1 [a](n = 2)							77.0 (39.6)	139 (17.0)	1.72
Exit Tier 2 in Grade 2 [b](n = 6)							46.7 (4.13)	92.7 (15.1)	1.27
New Tier 2 in Grade 1 (n = 6)							30.5 (7.4)	72.8 (12.2)	1.17

[a] One moved out of the school. [b] Three moved out of the school. [c] Data not applicable in Grade 2. [d] Data not applicable in kindergarten and Grade 2. [e] Data not applicable in kindergarten.

Figure 8.2. Movement Between Instructional Tiers—Cohort 1

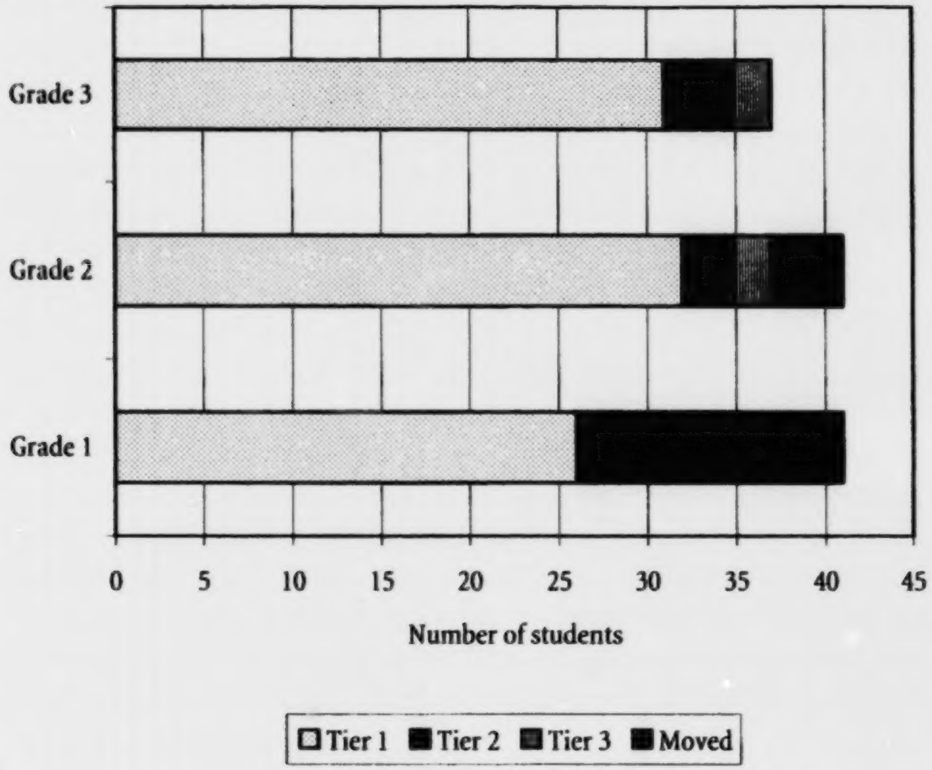
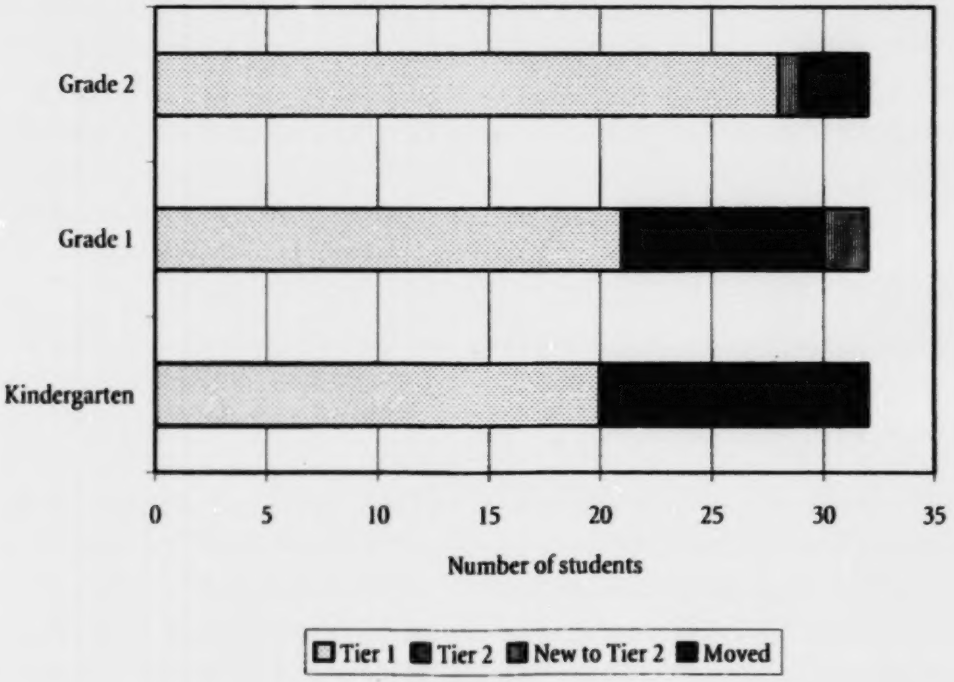


Figure 8.3. Movement Between Instructional Tiers—Cohort 2



8.3. The number of students in Tier 2 for Cohort 1 and 2 decreased as the students advanced through the grades. With only one exception (two students in Cohort 1), students who moved from Tier 2 to Tier 1 remained in Tier 1. The students who exited Tier 2 and moved into Tier 1, particularly those who exited at the end of Grade 1, continued to demonstrate gains in oral reading fluency, narrowing the gap between themselves and the students in Tier 1.

Movement also occurred from less to more intensive tiers for reading instruction. Over time, three students moved from Tier 2 to Tier 3 (special education) for reading instruction. At the beginning of or during Grade 1, nine students moved from Tier 1 to the more intensive instruction in Tier 2. Of the nine students, only one returned to Tier 1 for Grade 2 instruction.

Linking Partnership Activities and Outcomes

Teachers were interviewed to determine their perceptions of the relationship among the professional development activities, changes in teacher behaviors, and student outcomes. The partnership activity that teachers most closely linked to successful outcomes was assessment. Having a quick, effective way to identify at-risk readers and monitor their progress had a major impact on teacher practices.

The second partnership activity that teachers linked to outcomes was the weeklong summer professional development activity. Although teachers selected the professional development topics, it was not the topics that teachers reported as having the greatest impact; they said the next most important link was the opportunity to plan. The partners brainstormed ways to improve communications between teachers regarding students' needs and to align activities in the classroom so Tier 2 students could practice and apply new knowledge in the classroom.

The third activity that teachers linked to outcomes was the interaction between school and university partners. This connection occurred during professional development activities once a month after school. A comfortable format allowed for discussion of anything of interest to the teachers related to the partnership. Teachers also commented that they received more support and felt more supported because of the presence of university partners at the school.

The teachers did not feel that all partnership activities contributed equally to positive outcomes. In particular, teachers did not feel that observations and feedback contributed to student outcomes. Few teachers wanted observations and feedback during professional development activities. One teacher noted the changes due to observation schedules were not conducive to good relationships between school and university partners.

The university partners felt that one important contribution was the resources provided by the Eisenhower grant. Additionally, the involvement of undergraduate and graduate students during data collection facilitated the partnership's success.

Conclusions and Lessons Learned

There were many things to learn from the partnership about reading instruction in a rural school. The most important lesson had to do with trust between partners. When the teachers reported that they did not appreciate the observation strategies associated with the professional development, they highlighted the importance of trust in collaborative relationships. The partners learned that all aspects of the collaboration were open to discussion and that they should jointly discuss the benefits and difficulties of activities that are not accepted by all teachers. Additionally, because a new cohort of teachers was added each year and because of teacher turnover, the partners were constantly establishing new trust and collaboration. At all times, care should be taken to overcome the problems of scheduling and of working new teachers into the process.

Overall, the partnership was a positive experience for the teachers, students, and university partners. The teachers expressed satisfaction with the partnership and implemented much of what they had learned. The students at risk of reading difficulty generally improved their reading performance and narrowed the gap between themselves and their typically performing peers. The university strengthened ties with a rural school district and also provided a field setting for their student teachers. The professors participated in the professional development activities and learned more about the realities of the classroom.

While collaboration was a guiding factor in the school-university partnership, it added to the demands on time and instructional opportunities. However, time given to the partnership and related instructional changes overlapped and contributed to a goal-oriented effort. Collaboration and implementing new instructional strategies requires time and effort. But as a result of the efforts, the school, university, and (most important) the students gained something from the partnership.

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ACTION RESEARCH

CHAPTER 9

The Impact of Teachers' Participation in Collaborative Research on Secondary Students' Classroom Behaviors and Engagement

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This chapter describes the impact on secondary students of collaboration between university and teacher researchers in two high schools in a district adjacent to a large metropolitan area in the southwestern United States. Prior to the study described in this chapter, both high schools had a history of collaboration with the university, particularly in the area of action research. One school was affiliated with the university by formal agreement as a professional development school (PDS); the other school, which is in the same district, maintained more informal ties through individual university- or school-based projects. A representative from the teacher research group at the PDS and one of the university researchers were members of a PDS steering committee that met quarterly. Although a number of other collaborative activities existed at both schools during the time period described here, particularly in the PDS, this study focuses on the activities and outcomes of one longitudinal, collaborative teacher research project funded by a federal agency. Overall patterns of results spanning the 4 years are described, and specific data from 1 year of the study are used as an example of the outcomes.

Theoretical Framework and Objectives

Participatory research and development (PR&D) in education has been otherwise known by terms such as *participatory action research* (Reason, 1994); *collaborative research* (Lee, 1993); and *collaborative inquiry* (Sirotnik, 1988). In the past decade, teacher participation in research has increased in the United States, although such involvement is not new (see Noffke, 1997). Teacher-as-researcher models have been established in other countries for some time (c.f. Nias, 1991; Stenhouse, 1971, 1975). For example, in the early 1970s in Britain, Stenhouse (1971, 1975) involved teachers and university faculty extensively in collaborative research. Teacher research was viewed as a means of staff development and an appropriate application of educational research because it addressed the problems of actual practice. While teacher research in America currently can be considered a vehicle for staff development (Richardson, 1994; Wilson & Berne, 1999), it also is credited with building "local knowledge" that teachers can use to improve classroom practice (Lytle & Cochran-Smith, 1994, p. 28; Cochran-Smith & Lytle, 1999).

Participation with others in inquiry also addresses the social nature of the construction of knowledge and the collective nature of knowing (e.g., Rogoff & Lave, 1984; Vygotsky, 1986). Group interactions create opportunities for learning (Little, 1993), increase the resources available to individuals, and enable teachers to process shared information through communication and collaboration (Rosenholtz, 1989). Because much of teacher knowledge is tacit and based on experience (Kagan, 1990), teachers may not be able to articulate assumptions, beliefs, and understandings in a manner necessary for conscious examination. As individuals interact in groups, they acquire common understandings and language. Group discussion becomes a vehicle for articulating, examining, and changing teachers' beliefs (Schecter & Parkhurst, 1993). Teachers' beliefs, in turn, strongly influence their behavior (Bandura, 1986). These behaviors should lead to changes in student behaviors and interactions that ultimately affect student achievement.

The purpose of this study was to determine the impact of participation in teacher research on the students of teachers in the project. More specifically, the objectives of the study were to investigate (a) changes in students' classroom behaviors and engagement related to teacher participation in implementation and evaluation of student-centered interventions and (b) teachers' perceptions and attitudes related to the link between participation in collaborative research and student behaviors.

Research Questions

To accomplish the objectives previously outlined, the following research questions were investigated:

1. How does students' use of learning strategies change during implementation of teacher-designed strategy interventions?
2. Is there a difference in student engagement in academic tasks before, during, and after implementation of teacher-designed strategy interventions?
3. What are teachers' perceptions of the relationship between teacher participation in research and students' engagement?

Although teachers also had research questions associated with their collaborative research projects, only the project-level research is included in this study.

Partnership Site Description

During the 1st year of the project, administrators and teachers from two large high schools in an urban district in the southwestern United States agreed to participate with a nearby university in PR&D activities. As previously described, one school had a PDS arrangement with the university (School A), while the

Table 9.1. School Demographics

	School A	School B
Total enrollment	2,850	2,513
Grade 9 enrollment	951	848
Grade 10 enrollment	786	657
Grade 11 enrollment	612	590
Grade 12 enrollment	501	418
Ethnicity (by percentage)		
African American	28.0	8.0
Hispanic American	18.0	13.0
European American	42.0	77.0
Asian/Pacific Islander	12.0	2.0
Native American	< 0.1	< 0.1
Other (by percentage)		
Economically disadvantaged	22.0	11.7
Limited English proficient	4.2	0.9
Special education	7.4	11.1
Gifted and talented	40.8	34.8

other had a more informal history of collaboration (School B). Both high schools included socioeconomically, ethnically, and academically diverse student populations, but School A had more diversity (see Table 9.1 for school demographic information).

Participating teachers had at least 3 years' experience in the classroom, and all taught classes that included at least four low-achieving students identified as at risk of dropout or academic failure or with mild learning disabilities. These students comprised the study's target. During Year 1, a total of 11 teachers from the two high schools (5 in School A and 6 in School B) participated in PR&D activities. The group, 1 male and 10 females, included 4 English teachers, 3 social studies/history teachers, 2 math teachers, 1 science teacher, and 1 special education teacher who was assigned as the coteacher in the science classroom. All teachers held bachelor's degrees, and one also held a master's degree. During Year 2, the project included 7 returning teachers and 5 new teachers (7 from School A and 5 from School B). The project added 18 new teachers in Year 3, all from School A, due to increased recruitment efforts by project teachers there. The trend toward increased participation continued during Year 4 of the project with 9 returning teacher-researchers and 15 new teachers. However, by the 4th year, all teacher-researchers were located in School A, the site of the PDS. The PDS arrangement may have contributed to the sustainability of School A's participation in the project.

Participatory Research and Development Model

During the 4-year period, teachers and university researchers developed a collaborative model of teacher research. The overall purpose of the PR&D effort was to create and sustain a community of research in practice among educators in order to investigate and develop successful instructional practices in inclusive classes and, ultimately, improve the academic outcomes of students with or without disabilities. At the heart of the model was the transfer of leadership from university researchers to experienced teacher-researchers.

The PR&D characteristics previously described were embedded in three phases of implementation during each year of the project: (a) development and implementation of interventions to improve student learning; (b) research design, data collection, analysis, and interpretation of results associated with the intervention; and (c) dissemination of findings. During the 3rd and 4th years of the project, these phases were conducted by mentor teacher-researchers who had been with the project during the first 2 years. Mentor teacher-researchers conducted the study teams and provided on-site guidance in Years 3 and 4. University researchers served as resources for intervention and evaluation methods during this period and as "mentors to the mentors." Each of the phases is described in more detail below.

Development of Interventions

During the first phase, teachers discussed an array of challenges to student learning in their classes and selected two or three areas for research focus. Teachers formed groups based on their research focus and content area and collected data to confirm or disconfirm that these challenges existed. Following confirmation of each challenge, they worked in teams to design instructional units and materials for classroom implementation. The teams met weekly, at a minimum, over 2 months at the beginning of each school year to assist each other in intervention development.

Research Design, Data Collection, Analysis, and Interpretation of Results

During the second phase of PR&D activities, teachers implemented their new plans, collected data, and analyzed the results of interventions. Prior to implementation, teachers participated in study groups to consider the question How will we know if our intervention has been successful? During these discussions with colleagues and university researchers, teachers learned about quantitative and qualitative research methods and designed or adapted data collection instruments to measure the effects of their interventions. University researchers served as resources during this period, providing information, guidance, and feedback. Finally, teachers implemented instructional interventions over a period of 7 to 15 days during the 2nd semester of the school year and received feedback from teacher and university colleagues.

Dissemination of Findings

The final phase of PR&D implementation each year focused on dissemination of findings. Teachers formally and informally discussed the processes and findings from PR&D activities with teachers in their schools and both school and district administrators. In addition, teachers teamed with university researchers to present papers at local, regional, and national meetings of organizations including the American Educational Research Association and the Council for Exceptional Children.

Methods

The PR&D model engaged teacher and university researchers in collaborative research at two levels. The first level involved school-university collaboration in the design of teachers' research studies to examine the effects of teacher-designed interventions on their students. At the second level, teachers collaborated with university researchers to investigate the impact of participation in the research on teacher-researchers, university researchers, and students in the teachers' target classes. Project staff observed teachers and students in classrooms and conducted interviews with administrators and teachers regarding the project. Teachers collected student outcome data related to their studies and assisted in the design of interview questions and the interpretation of quantitative and qualitative data collected at the project level. Teacher-researchers served as facilitators in discussion and interpretation of the impact of participation on all involved. In general, university and teacher-researchers followed a model allowing them to contribute in their particular areas of skills and knowledge while maintaining equity in status and power (Ulichny & Schoener, 1996). However, roles and contributions became more similar over time as teachers acquired expertise and assumed leadership of research teams.

Teacher-Research Projects

During all 4 years of the project, teachers worked in study teams to brainstorm instructional challenges they faced in their inclusive classrooms and to devise methods to confirm or disconfirm their perceptions of these challenges. During the 1st year, all teachers of the project expressed difficulties with both regular and at-risk students' ability to succeed on complex tasks. After reading and discussing related literature on use and mastery of higher-order skills in different content areas, teachers selected student use of learning strategies as their focal problem. They then worked in their classrooms to confirm or disconfirm the problem by collecting data on students' spontaneous and mastery use of learning strategies through the use of "think-aloud" interviews. Teachers concluded that most students could benefit from strategy instruction either as an aid to successful task completion or, in the case of high-ability students, as a means of enabling them to be aware of and articulate strategy use. While challenges identified by teachers varied somewhat each year, the process used for the collaborative research remained the same. In addition, each year several projects focused on students' strategy use either as continuation of previous studies or development of new studies arising from identified challenges with complex tasks.

Having confirmed that their problem existed and having obtained additional information about the nature of the problem, teachers then participated in a series of study team sessions to design intervention studies to address two questions: Are there differences among high achievers, low achievers, and at-risk students in their performance on tasks requiring them to find main ideas in written text (English teachers) or note and organize important information from lectures (social studies, science, and math teachers)? And is there a difference in the performance of students on tasks before and after an intervention designed to teach them strategies to effectively read for and find main ideas or select important information from lectures? The product of these sessions was the design of teacher-research studies by each subject area group (English, math/science, and social studies). During the 1st year, groups formed around content areas, with English teachers in one group, social studies teachers in another group, and math and science teachers in the third group. After completion of the studies, teachers met again in study teams to compare findings and to assist each other in interpretation of the data.

During the 2nd year of the project, veteran teacher researchers and their new recruits followed similar procedures and engaged in discussions of the challenges that existed in their inclusive classrooms. However, the 2nd year they built active involvement of students into the interventions as a result of the findings from the 1st year. They also abandoned their division into three content area groups and instead formed teams around interest in specific types of interventions. While teachers continued to assist each other in development, implementation, and interpretation of the findings of their studies as in the 1st year, the studies became much more diverse. University researchers continued to serve as facilitators of group discussions and resources for intervention and evaluation methods.

In the 3rd and 4th years of the project, planning meetings were held with seven teachers from Years 1 and 2 who volunteered to participate in Year 3 of the project as mentor teacher-researchers (MTRs). These teachers took a much more active role in mentoring the other teachers new to the project with skills and knowledge needed to conduct classroom research. Several workshops and small-group meetings were held to accomplish this mentoring. Consistent with the intent of the project and the research and development process, collaborative study teams made up of MTRs, teacher-researchers, and university educators again targeted problems of student learning in existing classroom environments and formulated outcome goals.

As in Years 1 and 2, new teacher-researchers, including a mix of experienced and new teachers as well as student teachers, worked in their classrooms to confirm or disconfirm instructional challenges or concerns by collecting data on students' spontaneous and mastery use of learning strategies and the degree to which they were engaged in classroom activities. Some teachers again conducted think-aloud interviews, while others used systematic observation instruments to obtain information on student engagement and interactions. As in the first 2 years, new teacher-researchers and MTRs assisted each other in data collection. While university professors were available as resources, they transferred primary control of the process to MTRs.

Project-Level Research

Descriptive information and intervention data were gathered through use of qualitative and quantitative research methods. The qualitative methods included teacher and district staff focus groups, individual interviews and questionnaires, and scripts from study group meetings. Project staff carried out the qualitative data analysis in stages consistent with the principles of theme analysis (Spradley, 1979, 1980) and naturalistic inquiry (Lincoln & Guba, 1985). After field notes, focus group discussions, and interviews were transcribed, they were analyzed to highlight key pieces of information. Tentative code names for themes were then assigned for related data. Theme organization was reviewed by other members of the project team and revised accordingly. An expert in qualitative methodology who was not part of the project also participated in the qualitative data analysis. The qualitative findings are used in this chapter to examine stakeholders' perceptions of the link between partnership activities and student outcomes (see Research Question 3).

Archival data and classroom observations were used to collect quantitative data regarding student outcomes. Student absenteeism and dropout information was collected from school records. Observers recorded student behaviors, engagement, and interactions between teachers and students using two instruments: an event-recording instrument developed by Boudah, Schumaker, and Deshler (1997) and a time-sampling instrument, the Classroom Snapshot (Stallings, Needels, & Stayrook, 1979). The observations provided data for measurement of changes in teacher and student behaviors before, during, and following the teacher-designed intervention (see Research Questions 1 and 2), and they provided teachers with feedback on the implementation of the intervention. For baseline data, teachers were asked to conduct "typical" lessons with their students and were observed for 3 days. During active intervention, teachers were observed three or four times while conducting a lesson with their students that highlighted or used the particular intervention designed for the target class. Teachers and students were also observed for 3 days at the end of the school year following the period of active intervention to determine the degree of generalized change in behaviors compared to baseline and active-intervention conditions. Interrater reliability of greater than 85% was required prior to data collection at each phase. At the beginning of the project, a comparison group of teachers was identified to provide more information about the impact of participation on students and teachers. During the 1st semester, however, it became apparent that comparison teachers and teacher-researchers were sharing information and skills and working closely together in areas related to the research projects. Therefore, the comparison group design was abandoned. A large number of comparison-group teachers joined the project the following year.

Results and Conclusions

As previously described, quantitative and qualitative methods were used to address the three research questions posed in the study. Results for each question are presented in the following sections.

Quantitative Findings

Research Question 1 investigated change in students' use of targeted strategies. Results of the target-student observations across a 3-year period indicated that teachers engaged the at-risk students in more strategy-related interactions during the research interventions. While these findings varied somewhat from year to year, the pattern was similar across time. For example, the pattern for all students across the three experimental conditions (main effects) for Year 1 (Boudah & Knight, 1999) demonstrated a statistically significant difference in total number of engagements between baseline and intervention conditions, favoring the intervention condition ($F(1,64) = 5.51$, $p = .022$). No statistically significant differences between total engagements in baseline and postintervention conditions existed, indicating that the rate for total engagements did not maintain an increase over baseline. When this intervention was removed, students returned to engagement rates similar to baseline. However, there were statistically significant differences in strategy-related engagements in favor of both the intervention condition ($F(1,64) = 88.63$, $p < .0001$) and postintervention condition over baseline ($F(1,64) = 14.62$, $p < .0001$).

Research Question 2 examined differences in students' engagement before, during, and after teacher interventions. Results of the whole-class observations of teachers' behaviors and overall student engagement also indicated differences in patterns of teachers' instructional practices and students' behavior during implementation of the intervention. Similar to the results of the target student observations, these profiles varied somewhat from class to class and year to year, but the overall pattern persisted. In general, compared to the baseline data, teachers engaged in more interactive instruction and discussion during the intervention and less organization, management, and monitoring seatwork.

Students were involved in more discussion and cooperative groups, received more academic instruction, and did less seatwork during the interventions. In addition, students exhibited fewer off-task behaviors during the interventions. Behaviors after the intervention for both teachers and students were less positive, however, often dropping slightly below gains made during the intervention, indicating little transfer once the intervention had ended. Nevertheless, data confirm the impacts of the intervention. Tables 9.2 and 9.3 present the results of the whole-class observations from the 1st year of the project.

These two sets of observation results suggest that teachers can design and implement interventions for students that more actively engage them in strategy-related behaviors. However, these changes are neither dramatic nor uniform. When the interventions are completed, students often return to their preintervention engagement rates. This pattern lends support to the effectiveness of the interventions. In interpreting these results, teachers concluded that when they directly target use of a particular strategy and provide opportunities for more interactive student involvement, students are more engaged in strategy use.

Another important source of student engagement data is the record of attendance during experimental conditions. While conducting classroom observations throughout the school year, project staff made note of student absences, particularly in intervention and postintervention conditions. During the 1st year, there was a total of 13 student absences in 134 baseline observations, 24 absences in 148 intervention observations, and 47 absences in 132 postintervention observations. The absence ratios were 9.7% in baseline, 16.2% in intervention, and 35.6% in postintervention. Moreover, approximately one third of the students classified as at risk but not in special education either dropped out or were sent to alternative programs by the end of the school year. This finding may be due in part to the brevity of the intervention. While it increased the engagement of target students when they were in class, it appeared to have limited influence outside that class. Students may have had difficulties in other classes that resulted in their dropping out or being expelled.

Making the Link Between Teacher Research and Student Outcomes

The naturalistic data analysis revealed several important themes regarding changes in school climate and culture. For this chapter, only the themes related to student outcomes will be discussed: attitudes toward students and changes in teaching. These two themes were used to investigate Research Question 3, which gauged teachers' perceptions of the relationship between their collaborative activities and student outcomes during the same time period in which they developed, implemented, and evaluated their research studies.

Table 9.2. Teachers' Classroom Involvement

	Baseline	During intervention	Postintervention
Monitoring silent reading	0.283(04.16)	00.50(01.58)	05.33(10.68)
Monitoring written work	16.66(12.37)	17.00(11.51)	17.33(13.86)
Reading aloud	02.33(03.86)	00.33(01.05)	03.00(05.07)
Instruction/Explanation	37.66(13.42)	43.33(19.62)	34.33(14.91)
Discussion	15.16(07.38)	18.66(13.04)	14.16(15.21)
Practice drill	00.66(02.10)	00.50(01.58)	00.33(01.05)
Kinesthetic	08.33(10.91)	06.99(12.21)	07.33(08.57)
Projects	03.00(06.74)	02.00(06.32)	03.66(09.35)
Social interaction with students	03.99(07.16)	03.00(05.31)	01.50(02.54)
Student uninvolved	00.00(00.00)	00.00(00.00)	00.00(00.00)
Providing discipline	00.00(00.00)	00.33(01.05)	00.00(00.00)
Classroom management	05.66(04.17)	06.33(03.66)	06.16(05.98)
Making assignments	03.66(03.31)	01.00(02.25)	06.50(08.02)

Table 9.3. Students' Classroom Involvement

	Baseline	During intervention	Postintervention
Reading silently	0.212(03.25)	00.66(01.54)	03.40(07.17)
Written assignments	16.64(11.68)	15.96(12.72)	11.87(09.04)
Reading aloud	01.88(03.32)	00.30(00.94)	01.66(03.43)
Receiving instruction	28.96(10.66)	35.98(17.13)	29.29(15.04)
Discussion	11.51(06.75)	16.63(10.96)	11.89(13.96)
Practice drill	00.42(01.34)	01.32(02.97)	00.15(00.49)
Kinesthetic	08.36(11.59)	05.03(08.52)	06.95(07.03)
Projects	02.03(04.71)	02.25(07.11)	03.53(09.43)
Social interaction	07.65(05.73)	04.99(06.35)	06.31(05.50)
Student uninvolved	11.76(06.74)	07.62(03.66)	12.56(06.00)
Being disciplined	00.23(00.68)	00.15(00.25)	00.17(00.37)
Classroom management	05.18(03.11)	07.95(04.44)	05.74(05.55)
Receiving assignments	02.88(02.57)	00.93(02.22)	05.51(07.32)

Attitude Toward Students

Teachers' comments about their students were initially somewhat negative, focusing on students' or families' lack of responsibility as the major reason students were not learning. Teachers expressed a sense of helplessness in the face of all the external factors that had an impact on their classrooms (e.g., poverty, legislative mandates, parental apathy). Students were seen as unmotivated rather than lacking skills. Teacher-researchers constantly recounted the difficulties encountered in inclusive classrooms (in which students with learning disabilities were included with students of varying ability levels); they did not know how to manage the extreme differences in students in their classes. They felt unable to do as many activities or cover as much content as they knew parents and administrators expected, and they frequently used the term *burnout* to describe their feelings. Many said they joined this teacher-research group because they hoped they could get help with a difficult situation.

As their participation in research increased, teachers became more aware of their role in affecting student performance. During the think-alouds, they realized that students did not possess certain skills and strategies needed to succeed at specific tasks. They mentioned that they previously had thought that students had the skills and knowledge, but chose not to do their work. In particular, they noted that they had changed their perceptions of special education students as a result of participation in the project. Rather than lazy or unmotivated, these students now seemed hardworking but struggling to attain certain skills other students might take for granted. In the words of one teacher-researcher:

> One of the most revealing insights came from conducting "think alouds" with the students. Before this project I had not even heard of or considered this or any method to find out how students "think" ... [and I learned] not all students process the information the same or even remotely the same—even if they are of similar ability levels. "Think alouds" were done with our special education students, low achieving students and high achieving students. The most interesting outcome was to discover that special education students had many different strategies known to them ... but they either didn't help for some reason or were used inappropriately. This indicated to us that skills were not lacking but helping them to know when to use certain techniques was important.

However, they also recognized increased difficulties for a group of students they began to refer to as "shadow students" because they were not recognized officially by the educational system. These students typically were low-achieving and at risk of dropping out of school, but they had not had the benefits of resources provided the special education students.

Changes in Teaching

Teachers reported many modifications in their teaching practices as a result of participation in the project. "Even if outcomes are bad, you find out what worked with students or didn't," noted one teacher-researcher. "I learned a lot about learning styles. My teaching improved." Another said, "I find I think more about what I am doing in class and how what I do, or do not do, affects students. I find that a lot of times I need to be the one to change my requirements and expectations." Comments such as "I am aware of the need to try different things, especially for students who are working at a really low level" were common.

The changes in teachers' views about mainstreamed and "shadow" students also made participants question the more teacher-centered approaches they had been using. Above all, they saw the need for active student involvement in learning and the need for more personalization of teaching and learning. As a result, they sought activities to promote active student involvement, formal recognition of students' successes, closer work with special education teachers, and varying activities to maintain students' interest. These perceptions of needed changes are corroborated by the observation data reported in the previous section.

In summary, at the beginning of the project, it was apparent that teachers perceived that students were responsible for their failures and that students needed to adapt to the teachers' classroom expectations. In addition, most teachers believed that students with disabilities held back the class. After several months of project involvement, however, teachers realized that many low-achieving students, particularly students with disabilities, were hard workers. It also appeared that teachers began to accept some of the responsibility for their students' performance and realized that their actions did have an impact. One teacher stated that it was important to understand student failure and to find preventive strategies. Some teachers also thought they now paid more attention to their students with disabilities and that they were not as frustrated with them as before the project. It appears, therefore, that engaging in classroom research focused on low-achieving students and those with disabilities helped teachers become more cognizant of the students' needs and abilities. Teachers reported that participation in research affected their attitudes about students and teaching approaches, and observation data provided evidence that they did indeed change their teaching behaviors during their interventions and that students were more engaged and less off-task when the teachers did so.

Implications

The secondary school classroom has been described as the most structurally rigid setting in our educational system with regard to the process of planning, adapting, and individualizing instruction for students with disabilities (Brandt, 1989; Cuban, 10)3). Because the role of the secondary teacher is primarily centered around delivering content, lessons in these classrooms often consist primarily of lectures, few interactions between teacher and students or among students, and much independent seatwork by students including significant time completing worksheets (Cawelti, 1994; Goodlad, 1983). More impersonal, whole-group, and academically focused instruction prevails in secondary settings (Brophy & Good, 1986). Behaviors of teacher-researchers in this study initially were consistent with this depiction of the passive secondary classroom.

Participation in the PR&D activities, however, changed teachers' perceptions and classroom behaviors with resulting implications for student performance. Consistent with teachers' perceptions, students in general were more actively engaged in academic work and exhibited fewer off-task behaviors during implementation of research interventions. Furthermore, students were given more teacher attention and were more engaged in targeted strategies. However, the high rates of absenteeism and number of dropouts among target students are causes for concern. Both high schools involved in this project have schoolwide discipline systems in which a certain number of student offenses results in detention, then in-school suspension, then expulsion. Participating teachers had little control over this system. Clearly just keeping these at-risk students in class should be an important priority for schools in order to be successful with them. In short, educators cannot expect that interventions will significantly improve the performance of at-risk students if the students are not highly engaged or, worse yet, not in class.

Several indicators of more widespread school culture and systems change, which would have an impact on more students, seem apparent as well. While the intended level of impact was the individual classroom, the model has implications for improvement at the school and district levels. Teachers acquire knowledge and skills that they then have available for other classes in subsequent years. Furthermore, because the interventions are designed for whole-class improvement, students other than those targeted as at-risk will benefit. Development of MTRs will help ensure that the expertise needed for teacher research remains in the school or district and does not disappear when the funding ends. In fact, in School A, teacher-researchers have infused the research process into the campus' improvement team structure.

An interesting finding, although not formally investigated, is the difference in persistence of teachers located in the PDS and those located in the school with more informal collaborative links. By the end of the 4 years when funding ended, participation in PR&D continued and increased considerably in the PDS but disappeared in the second high school that had no formal linkages with the university. The PDS appeared to provide a vehicle for recognition, support, and communication of PR&D activities and outcomes not present in the other high school.

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CHAPTER 10

STAR—Students and Teachers in Action Research

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In 1998, Pittsburg State University (Kansas) College of Education joined with two area school districts to form the Professional Development School (PDS) Partnership. A key component of this collaboration is STAR—Students and Teachers in Action Research, a yearlong, intensive experience that teams senior-level elementary education majors, mentor teachers, and university professors in field experiences and action research projects.

This chapter describes the action research component of the partnership during the 1999-2000 school year. The chapter begins with a rationale for including action research as a component in the PDS experience. It continues with a brief description of the partnership sites and then details the action research activities undertaken by the university-school teams. Four examples of action research projects follow, including summaries of their results in student achievement. The chapter concludes with a discussion of the impact the action research projects had on elementary and middle school students, teaching interns, and mentor teachers.

The Rationale for STAR

Action research is a critical component of the PDS partnership for two reasons: It instills in teacher interns the habits of reflective practice that can lead to improved teaching and learning, and it supports educational renewal for both classroom teachers and teacher education faculty with the objective of increasing student learning.

The National Council for Accreditation of Teacher Education (NCATE) includes engaging in educational research and renewal with K-12 schools as one of its standards for professional education units (2001a). Action research can result in improved teaching, which leads to enhanced student learning and higher academic achievement. As a deliberate, solution-oriented investigation, action research consists of spiraling cycles of problem identification, systematic data collection, reflection, analysis, data-driven action, and finally, problem redefinition. The linking of the terms *action* and *research* highlights the essential feature of this method: trying out ideas in practice as a means of increasing

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knowledge about or improving curriculum, teaching, and learning (Kemmis & Di Chiro, 1987).

In action research, practitioners work collaboratively to help one another design and carry out investigations that tackle the everyday practical problems experienced by teachers rather than the theoretical problems defined by traditional researchers within their discipline of knowledge (Nixon, 1987). Action research is designed, conducted, and implemented by the teachers themselves to improve teaching in their own classrooms.

Teacher research expands the teacher's role as inquirer about teaching and learning through systematic classroom research (Cooper, 1990). A study group provides support and a forum for sharing questions, concerns, and results. Teachers advise each other and comment on the progress of individual efforts. Engaging in collaborative action research promotes professional dialogue, helping to eliminate the isolation that has long characterized teaching.

The current school restructuring movement has site-based, shared decision making at its core. Teachers are called upon to make informed, data-driven decisions. Therefore, it is necessary for teachers to be more deliberate in documenting and evaluating their efforts. Action research assists practitioners in identifying the needs, assessing the development processes, and evaluating the outcomes of the changes they define, design, and implement (Knight, Wiseman, & Cooner, 2000). Furthermore, action research provides teachers with the opportunity to gain knowledge and skill in research methods and applications and to become more aware of the options and possibilities for change (Lee, 1993). Teachers participating in action research become more critical and reflective about their own practice (Oja & Pine, 1987; Reason, 1994). They attend more carefully to their methods, perceptions, understandings, and their whole approach to the teaching process.

Given action research's potential to positively affect teaching and learning, the developers of the PDS partnership included an action research component in the program. The expressed purpose of these action research efforts includes

1. Improving the quality of education for K-12 students by encouraging teachers to use research-based techniques and teaching strategies.
2. Providing teacher candidates with an authentic school-based experience that effectively exposes them to the unique elements of a diverse student population and the expertise of experienced professional educators.
3. Stimulating the faculties of both the university and the participating K-12 schools to develop professionally through continuous collaboration and interaction.

Description of Partnership Sites

Pittsburg State University (PSU), a state-funded university located in southeastern Kansas, serves 6,100 students primarily from the four-state area of Kansas, Missouri, Oklahoma, and Arkansas. It graduates approximately 100 elementary-certified teachers each year.

In spring 1996, PSU's Department of Curriculum and Instruction and a rural local school district collaborated to bring Project PLUS (Partnership Linking University and Schools) to one of the district's K-5 elementary schools. This program matched senior-level elementary education majors taking the mathematics methods course with classroom teachers in a real-world setting. Each intern observed six lessons and taught six whole-class mathematics lessons. Furthermore, interns participated in a schoolwide mathematics carnival. Project PLUS augmented the already-established preparation for elementary education majors, which consisted of two preprofessional laboratory experiences of 30 observation hours each, a reading and language arts practicum, and a science discovery lesson.

Faculty from the College of Education, educators from the participating school district, and an interested adjoining school district recognized the success of these projects. Together, they developed a plan for a PDS partnership that would provide a specialized, more intensive laboratory experience for senior-level education majors. In August 1998, the College of Education named a PDS director and recruited area teachers, administrators, university students, and faculty to serve on the advisory board. The PDS followed the lead of other such collaborative efforts across the nation, with the partnering institutions sharing responsibility for the clinical preparation of new teachers, the continuing development of school and university faculty, the support of children's learning, and the encouragement of research directed at the improvement of teaching and learning (NCATE, 2001b).

The two school districts are located in southeastern Kansas. The first district has a total student population of approximately 2,600 and is located in the same town as the university. Mentor teachers chosen from all three of the district's elementary schools (Grades K-5) and the middle school (Grades 6-8) participated in the action research. The student population is predominately Caucasian with a growing Spanish-speaking population. Approximately 60% of the elementary-age students meet federal guidelines to receive free or reduced-price meals.

The second district serves an adjoining community. It has a total student population of approximately 750. Mentor teachers from the K-6 elementary school participated in the partnership. The minority population is less than 2%. Approximately 30% of the students qualify for federal assistance.

STAR Activities

The STAR program, as part of the larger PDS partnership, is designed to give a selected group of senior-level elementary education majors a more intensified field experience. During their first 3 years, all elementary education majors at

PSU participate in a variety of preprofessional field experiences resulting in more than 90 hours of fieldwork. During the spring of their junior year, those wishing to participate in the PDS interview with mentor teachers and university faculty, who make the selection of who will participate as interns the following year. Mentor teachers serve voluntarily and must be recommended by their building principals and colleagues.

During the summer before their senior year, interns and their mentor teachers attend a 3-credit-hour course in which they learn how to design, conduct, and evaluate action research. During the course, the teacher-intern teams review their district's state and local assessments and determine a research question based on an identified problem or focus area with the goal of improving student outcomes. They review the literature for previous research and then design, write, and implement an action research project that they conduct over the course of the following academic year. With resources available from a small grant, they may also purchase up to $300 in materials to conduct their research. The teams meet two times per semester, providing support and a forum for sharing questions, concerns, and results. Teams advise each other and comment on the progress of individual efforts.

In addition to their action research projects, STAR interns spend a minimum of 15 hours per week in the classroom during the fall semester of their senior year, resulting in more than 240 volunteer hours from each intern. They also take 12 hours of methodology courses that include mathematics, social studies, and two reading instruction courses. In the spring, interns spend a full semester (16 weeks) in the same classroom student teaching.

Results and Conclusions of the Action Research Projects

During the 1999-2000 school year, 20 elementary and middle-level classroom teachers, 16 elementary teacher candidates, and five teacher education faculty members participated in the yearlong action research project. Each teacher-intern team chose its own topic with support from university faculty members. Some teams chose to work across several grade levels, while others decided to limit their study to one class or grade level.

The action research projects for the 1999-2000 school year included 11 topics that targeted student learning (see Table 10.1). Nine of the final action research reports indicated that elementary students made academic gains as a result of the interventions studied.

The Link Between STAR and Student Achievement

The participation of these 11 STAR teams in the yearlong action research projects set off a chain reaction that ultimately led to higher student achievement in their classrooms. First, during the summer of 1999, the teachers and interns acquired the skills and knowledge they needed to conduct action research in

Table 10.1. Overview of Action Research Projects

Intervention	Measures of student learning	Outcome
Technology-enhanced social studies	Chapter tests Daily assignments	Gains were positive
Single-gender mathematics classroom	Chapter tests Achievement test	Gains were positive for the single-gender classes
Multiple intelligences and learning-disabled students	Daily assignments Pretests and posttests	Gains ranged from 2 to 4 percentage points
Simulations and games in social studies	Pretests and posttests	Gains ranged from 3 to 6 percentage points
Portfolio use in prealgebra	Portfolio and teacher-created rubric	Gains were positive
Reading comprehension and individual reading inventories	Individual reading inventories Achievement test	Results were inconclusive
Small-group reading instruction	Achievement test Daily assignments	Results were inconclusive
Portfolio assessment in social studies	Student portfolios Chapter tests	Gains were positive
Using novels to teach reading comprehension	Book tests Achievement test	Gains were positive
Success For All Reading	Reading surveys SFA assessment Flynt-Cooter Reading Inventory Teacher observations	Gains were positive
Enhancing listening skills	Reading comprehension and AR tests	Close proximity to the teacher resulted in a higher score

their classrooms. Next, throughout the 1999-2000 school year, the STAR teams, supported by faculty from the university, systematically collected and analyzed data about the efficacy of their teaching practices.

The teachers and mentors then used the results to improve their teaching. In 9 of the 11 projects, the teacher-intern teams concluded that their interventions did indeed improve student achievement, and they resolved to continue using these teaching practices, now validated by their own action research. In some cases, the teachers and interns made slight modifications to their instructional strategies for future use, while other teams decided to expand their use of the intervention to other subject areas or other students. The following four case examples illustrate the increases in achievement attained by the students.

Case Example 1: *Will the use of portfolio assessments in social studies affect student performance?*

After reviewing the social studies assessment tools used by the district, a fifth-grade teacher-intern team decided to investigate the use of portfolio assessment in the social studies classroom. In their literature review, they found information about the Comprehensive Social Studies Assessment Project (CSSAP; National Geographic Society, 1999), which incorporates the use of portfolios into the teaching of social studies. The same teacher-intern team taught all three sections of fifth-grade social studies, but they used this strategy with only one of the three fifth-grade classrooms.

The CSSAP portfolio included interpretation, issue analysis, problem solving, reasoned persuasion, and research/investigation. Every fifth-grade student submitted examples of work for each category, and the teacher-intern team reviewed each student's portfolio. A teacher-made rubric was used to grade portfolios.

The research team compared the results of the paper/pencil tests given to every student during the course of the academic year. Only Group 3 used the portfolios, while Groups 1 and 2 received the conventional social studies instruction. All three groups took the same paper/pencil tests. As Figure 10.1 shows, students using the portfolios scored consistently higher on the social studies tests for all four quarters.

The teacher-intern team also reported that Group 3 showed more enthusiasm for studying social studies during the entire year. Students in this group had more opportunities for individual and group research and asked more in-depth questions during class discussions.

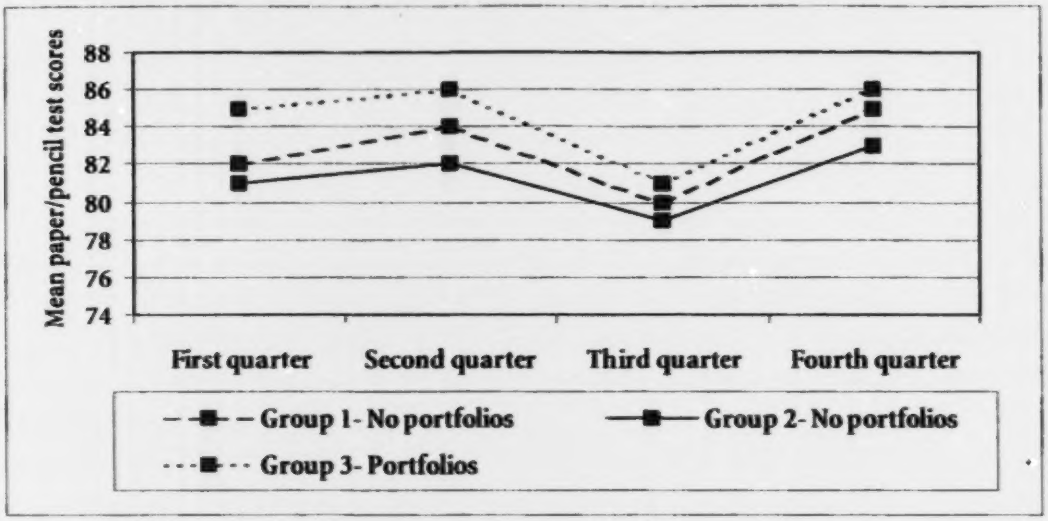
Case Example 2: *Will greater proximity to the teacher enhance listening skills in second-grade students?*

Another mentor teacher and intern focused on improving the listening skills of second-grade students. The mentor teacher was a veteran of more than 25 years and had noticed a significant change in students' listening skills over the past few years. She described the behavior as "listening with half an ear."

While reviewing the literature, the team found many factors that affect the listening abilities of primary-level students. Sources suggested that the onslaught of noise from their daily lives, such as from radio, television, peers, adults, and their own physical environment, contributes to "nonlistening." Children hear so much "talk" during the course of the day that they quickly learn how to ignore it (Freiberg & Driscoll, 1992).

Another factor affecting listening is mind-set, which generally carries one of three purposes: listening to confirm, listening to answer questions, and listening to confront. Of the three, only listening to confirm is common (Arends, 1988).

Figure 10.1. Comparison of Portfolio and Nonportfolio Groups



Often students listen with preconceived questions or ideas. As the teacher moves from point to point, students focus on information that relates to or confirms their preconceived notions, excluding all the other messages. But because information links one topic, concept, or skill to another, all points are necessary to build understanding (Arends, 1988).

The research team found a variety of teaching strategies in the literature recommended for improving listening skills. These included increasing proximity of the teacher to the student, increasing the speaker's enthusiasm, engaging in discussions, maintaining a distraction-free environment, and providing a purpose for listening. The teacher-intern team decided to focus on proximity to the teacher, incorporating books from the Accelerated Reader program in their research design.

Each week, the educators read one to three developmentally appropriate Accelerated Reader books to the students. The second graders then answered questions about the books on paper or on the computer. The teacher and intern employed various degrees of teacher-student proximity, and they videotaped several read-aloud sessions for further study.

Sometimes students sat at their desks while the teacher or intern read the story from behind the teacher's desk. At other times, students sat on the floor next to the teacher or intern, who read from a rocking chair. On occasion, the teacher or intern would stand at the back of the room and read the story while the students sat at their desks with their backs to the reader. At the end of the school year, the teacher-intern team examined the students' scores from the Accelerated Reader tests and matched those results with the level of proximity to the teacher. They calculated a mean score for each test.

The results showed that students scored 1 to 2 points higher than average when the reader's proximity to the students was the greatest—with the teacher seated in a rocking chair and the students on the floor next to the teacher. Students' scores were lowest when the teacher read from the back of the room and the students sat with their backs to the teacher.

After reviewing the results of the study, the team used the information to guide their teaching of other subject areas, such as mathematics, science, and social studies. The team plans to expand the study to incorporate some of the other variables, such as enthusiasm of the reader, opportunity for discussion, and setting a purpose for reading, in a future study. They also want to determine whether the results are the same for younger and older students, so they are recruiting other teachers to participate in their study.

Case Example 3: *Can the use of games and simulations improve academic achievement in an eighth-grade history class?*

A teacher-intern team in a sixth-through-eighth-grade middle school wanted to improve the academic achievement of students in an eighth-grade history class. The team taught four sections of history to approximately 100 students.

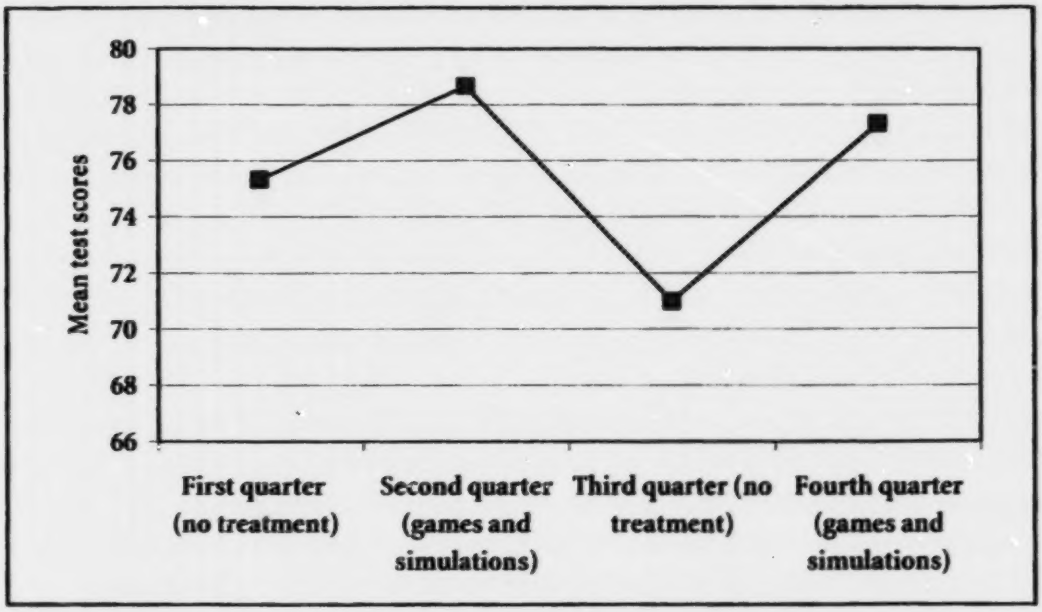
The team reviewed the literature for innovative educational practices designed to optimize learning especially for the middle-level learner. They found an article about a teacher who developed centers based on Howard Gardner's theory of multiple intelligences. As a result of using the centers, that teacher's students developed increased responsibility and independence, developed and applied new skills, and improved their cooperative learning skills. Furthermore, academic achievement increased as measured by classroom and standardized tests (Campbell, 1992).

The team also reviewed the work of Rieber (1996), who found many advantages to using games and simulations as part of the learning environment. Because play is usually voluntary, it is intrinsically motivating, and it involves active participation. Rieber found that the benefits of play are long term, thereby enabling intellectual and social growth over many years.

The team further learned that simulations in the classroom encourage student participation. Simulations have the power to recreate complex, dynamic political processes in the classroom. They allow students to examine the motivations, behavioral constraints, and interactions among their classmates (Rieber, 1996).

The team decided to create their own or use commercially available games and simulations during alternating quarters of the school year. During the 2nd and 4th quarters, they would teach social studies using games and simulations. In the 1st and 3rd quarters, the team would teach the history classes in a traditional manner without games or simulations. During the 1st quarter, they would to get to know the students and develop the games and simulations for the 2nd quarter. They opted not to use the games and simulations during the 3rd quarter because that is when the students take the state assessment for social studies.

Figure 10.2. Mean Test Scores With and Without Games/Simulations



When choosing or creating the simulations, the team first defined the academic outcomes they wanted the students to achieve. Next, they identified all the major participants in the process to be studied. They then constructed a "role sheet" for each player or group. The teachers sought to devise scenarios that interested and challenged the students. Finally, the students and teachers established ground rules.

In addition to the simulations, the students used board games and card games to review facts and concepts. Every quarter, the students took a pretest and posttest for each unit of study. During the 2nd and 4th quarters, the educators used games and simulations for both teaching content and reviewing before the posttest. The teacher-intern research team compared the mean increases in scores from the pretest to the posttest for each quarter. The mean posttest scores for the quarters when students used the games and simulations ranged from 3 to 6 percentage points higher than the quarters when the treatment was not used (see Figure 10.2).

Some of the games and simulations did a better job than others of reinforcing the concepts taught. The team found that they needed to alter the commercial simulations to fit the time, space, and resource constructs of their classroom. They also found the simulations very labor intensive and time consuming. Furthermore, the simulations generally took more than one 55-minute class period. The commercially produced games also needed some modification, but not as much as the simulations.

Case Example 4: *Will the Success For All Reading program increase the comprehension scores on the Flynt-Cooter Reading Inventory for second- and third-grade students?*

A new reading program, Success For All (SFA) Reading, was implemented in a K-6 elementary school participating in the PDS partnership. Two classroom teachers (Grades 2 and 3) and their interns decided to investigate the efficacy of this new program as their action research project.

SFA Reading is a comprehensive, prekindergarten-through-Grade-6 reading program that focuses on helping children read at or above grade level. Created by educators at Johns Hopkins University, this program targets all children, not just select groups. By using early intervention, the program helps students who are below grade level in reading receive immediate attention.

Key elements of SFA Reading include grouping children by reading level and providing tutors for those students who need additional help. Teachers provide intense reading and writing instruction, stress problem-solving strategies, and give frequent assessments to determine progress. In addition, every teacher is trained by reading specialists to ensure mastery of the program.

The teachers at the school were apprehensive about the new program because of the cost (approximately $261,000 to $646,000, depending on school size) and the amount of preparation time required to teach the very structured and controlled instruction (90 minutes per day). They were also concerned about the fact that ability grouping is required and that movement to other classrooms could be disruptive to the learning environment.

The elementary teachers and interns received training from the SFA reading specialists in August to prepare for implementing the program. During the first 2 weeks of school, the research team randomly selected 9 students from the second grade and 9 students from the third grade as the action research sample. The teachers included in the sample boys and girls from the top, average, and low academic levels based on SFA scores. While all of the students and teachers in the school participated in SFA, the researchers analyzed only the data from the sample students. The sample represented approximately 36% of the second- and third-grade population.

The teacher-intern teams gathered supplemental data from a variety of sources. Parents completed reading surveys during the 1st week of school and again in May. Teachers administered SFA assessments every 8 weeks. Students read a passage from the Flynt-Cooter Reading Inventory (1998) on their grade level and completed a reading attitude survey every quarter. Additionally, teacher and student reflections and observations were collected throughout the year.

Reading attitudes were very positive at the beginning of the year. On a 100-point scale, the 1st-quarter results charted at 87. During the 2nd quarter, the attitude score increased to 91. Third-quarter results dropped to 88, and the last-quarter results were 86. Overall, reading attitudes decreased 1% over the year. Teachers credit the increase in the 2nd quarter to the new and motivating program. The overall decrease in reading attitudes was thought to be the result of the intense SFA instruction and to the relentless pressure to read.

On the Flynt-Cooter Reading Inventory, students answered 72% of the comprehension questions correctly during the 1st quarter. The 2nd quarter results increased to 80%, the 3rd quarter to 83%, and the 4th quarter to 87%. This is an overall increase of 15%.

The students from the third-grade sample read a third-grade passage from the Flynt-Cooter Reading Inventory during the 4th quarter. Eighty percent of the sample read the passage independently and fluently with no mistakes. This was a significant increase over the students' performance in August. One student was a nonreader in August and scored near grade level in May. His attitude toward reading became more positive, and his teacher reported that he "shows off" his reading ability.

Most students liked the SFA Reading program. They liked to move to other rooms because they were able to be with students and teachers who were not in their homeroom, and most students reported that the reading activities were enjoyable. Conversely, several students did not like moving to other rooms, thought 90 minutes was too long, and said the reading activities were boring. These students were generally in the lower ability groups. Teachers and interns noted that some students who lacked intrinsic motivation did not progress as rapidly as other students.

But Is It *Real* Research?

Like university-based researchers, the STAR researchers posed questions, gathered and analyzed data, and drew conclusions about their findings. Some academics, however, debate whether such practitioner inquiry meets the standards of "real" research (Andersen & Herr, 1999; Huberman, 1996). Much of this debate has centered around issues of rigor in terms of research design, researcher impartiality, data collection, and data analysis (Andersen & Herr, 1999).

Regarding research design, most of the 11 teams did not employ the so-called "gold standard" of cause-effect research designs—a true experimental model with randomization and control groups. The educators in Case Example 1, however, who investigated the effectiveness of portfolios in teaching social studies, did use control groups. Furthermore, the teachers in Case Example 3 used a successive pre/post testing design (also known as the ABAB design) to gauge the effectiveness of games and simulations in teaching eighth-grade social studies content.

The STAR researchers' impartiality also falls short of the standard for traditional research, which requires researchers to maintain an objective viewpoint as outside, uninvolved observers. Definitely, the educators on all 11 action research projects were not outsiders. These educators acted as participant observers who had a stake in the outcome of their research projects.

To counter this lack of impartiality, the educators from the different teams met periodically throughout the duration of their projects to critically challenge each other's findings. In this way, the researchers maintained what Andersen and Herr (1999) call *dialogic validity,* in which researchers keep themselves honest by engaging in peer review and critical discussions about their research.

As for the rigor of the data collection efforts of the 11 teams, only three projects relied solely on data from teacher-devised assessments. All others used data from at least one standardized source such as national norm-referenced achievement tests, state assessments, chapter tests, or commercially produced tests.

Although in most cases the STAR researchers may have introduced the possibility of unreliability and bias by collecting and scoring achievement data themselves, four projects did utilize standardized achievement tests. The resulting data represent some degree of objectivity in that teachers administer them "by the script" and scoring occurs off-site.

Finally, during data analysis and interpretation, the STAR researchers may have been influenced by their desire to see success for their interventions. To counter the predisposition to "see what you want to see," the action researchers periodically engaged in dialogue with their critical friends at other PDS sites and at the university. Once again, these discussions strove to keep everyone honest to the data.

The STAR teams embarked on their research projects not to generate new knowledge or theory that could generalize beyond their own classrooms and schools. Rather, they gathered and analyzed data to inform their *own* practice. Specifically, all 11 teams examined interventions they had implemented in their own classrooms and asked three central questions:

- Did it work?
- Is it worth continuing?
- How can we make it better?

They used the techniques of research to address the practical concerns they faced in their own classrooms. In the truest sense of the concept, they conducted research that helped them take action to improve the teaching and learning in their classrooms.

Implications

The STAR PDS partnership model holds positive implications for a variety of stakeholders:

- Students benefit academically from enhanced teaching practices, refined methodology, and improved assessment resulting from the action research projects conducted by the teacher-intern teams.

- Interns benefit from real-world experiences and from participation in action research at an early stage of their careers.
- Classroom teachers who participate in action research become more reflective about their own practice. They attend more carefully to their methods, their perceptions and understandings, and their whole approach to the teaching process, resulting in higher achievement for students.
- School districts benefit from the yearlong professional development for classroom teachers.
- University professors benefit from the simultaneous renewal that occurs by working with teachers, interns, and students in classroom settings.

Beyond an immediate impact on student academic outcomes, other positive results ensued from the program. Preservice interns had an opportunity to participate in action research while working with a mentor teacher in a supportive and nurturing environment. On an end-of-year survey, graduates of the STAR PDS program reported a desire to continue action research in their future classrooms.

Time and budget constraints are the primary deterrents to this program. Meeting with teachers and interns after school and during the school day places an added time burden on the university faculty as well as on the teacher-intern teams. The money used for materials to support the action research projects initially came from a small Eisenhower Professional Development grant. The grant was nonrenewable, and new sources of funding are constantly being explored.

On the whole, participants reported satisfaction with the STAR PDS model. They commented positively about the experience of collaborating with other professionals. Teachers and interns alike reported feeling empowered by their own teaching and research skills as a result of participating in action research. One teacher stated, "I always want to teach like this. I never want to go back to the way I did things before!"

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SYNTHESIS

Making the Case: Lessons Learned From and About School-University Partnership Research

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The nine studies presented in this volume suggest frameworks for investigating the linkages among teacher education, school-university partnerships, and student outcomes. They also provide some tentative, emerging evidence that thoughtful, reflective, collaborative efforts can affect behavioral and learning outcomes—not only of teachers and future teachers but also of the students they teach. This chapter characterizes the nature of research in the nine studies, summarizes the impact of each type of partnership on K-12 outcomes, and provides suggestions for future research.

Because our confidence in any evidence of impact on student outcomes is related to the appropriateness of the research design, it is useful to consider these nine studies within the context of recent discussions on what constitutes scientific rigor in educational research (see, e.g., National Research Council, 2001; Cochran-Smith & Fries, 2001). From our perspective, similar to that of many others who have written on the topic (Darling-Hammond, 2001; Denzin & Lincoln, 1998; Richardson, 2001), scientific rigor is not necessarily synonymous with quantitative experimental or quasi-experimental designs; rather, rigor is determined by the appropriateness of the methods for the questions asked, the adequacy of the links in the chain of reasoning between interventions and impacts, and adherence to criteria related to the chain of reasoning. Both qualitative and quantitative methods may be used to investigate the linkages that are the topic of this volume and are subject to scrutiny for their scientific rigor.

The terms *quantitative* and *qualitative* connote methods rather than paradigms, they address somewhat different questions and are conducted for different purposes. Furthermore, given the current climate of accountability and national and state interest in certain kinds of research-based findings for determination of policy and resource allocation, emphasis on quantitative approaches for determining effects of interventions on outcomes has increased. Nevertheless, for the kinds of complex questions asked in school-university partnership settings, use of both quantitative and qualitative approaches within the same setting may be desirable. This combination may take the form of mixed methods under the umbrella of a dominant paradigm or two separate but complementary studies of the same partnership involving different paradigms, one naturalistic or ethnographic and the other predictive (we avoid the term *posi-*

tivistic due to negative connotations and misconceptions associated with its use). Studies of student outcomes in partnership settings typically investigate the relationship between interventions created as a result of school-university partnerships and their impact on K-12 students, and we maintain that use of both research methods is optimal, particularly when competing hypotheses about linkages arise. This can occur when the study design is hampered by sensitivities inherent in collaboration (e.g., teachers consider a particular kind of control-group design unethical) or by events within partnerships beyond the control of the researcher (e.g., suppression of negative data or perceptions).

Traditionally, experimental studies with random assignment to treatment and control groups have been considered the "gold standard" of educational research that purports to establish cause and effect. This perspective is still held in many settings today (see Abell Foundation, 2000). Similarly, longitudinal, in-depth, and ethnographic or naturalistic case-study research has been viewed as a means of producing explanations resulting in grounded theory that leads to better understanding of relationships among variables in complex settings (Bullough & Gitlin, 1995; Denzin & Lincoln, 1998; Eisner, 1998; Van Maanen, 1988). True experimental studies, however, are rare and probably not feasible in most educational settings. Even when conducted, they may lack the descriptive or explanatory aspect necessary for settings so complex. Likewise, the kind of ethnographic studies that result in explanations of considerable generality are also rare due to problems of time, resources, implementer bias, and expertise inherent in school-university partnerships. We are left in the best case with a preponderance of quasi-experimental or pre/post designs that document growth but are rife with alternative explanations for relationships between interventions and outcomes—and a plethora of qualitative studies that suffer from questions of credibility and applicability to other settings. For this reason, examination of this body of scholarship often results in proclamations about the "awful state of educational research" (Abell Foundation, 2000) and a tendency toward total dismissal of any findings generated.

While we agree that efforts to improve research quality should be encouraged, we also recognize that traditional standards of quality may not work in many settings (see, e.g., Andersen & Herr, 1999; Knight, Wiseman, & Cooner, 2000). For reasons outlined in the introduction to this text, the chain of reasoning between intervention and outcome may need to take a different form. For example, the relative strengths of a quantitative design may compensate for the weaknesses in a naturalistic design. When considered together, the two approaches may provide adequate data to construct a convincing chain of reasoning between school-university collaborative efforts and student outcomes. While we would not favor initiation of a "flawed" design when a more rigorous one is possible, circumstances common to collaborative settings may require less rigorous studies. By considering these problems in advance, researchers may be able to build into the initial design the means of obtaining data to address alternative hypotheses introduced by potential design problems or to determine creative means to address these questions post hoc. In the sections that follow, we attempt to determine the kinds of creativity and complementarity that exist in the studies in this book and how they are used to make a case for relationships between aspects of the partnership and K-12 student outcomes.

Impact on Students

As stated in the introduction to this volume, the nine studies presented here can be grouped into three categories: comprehensive reform efforts, targeted curricular reforms, and action research. Table 11.1 provides a comparative summary of the studies, and the following sections summarize the impact of each type of partnership on K-12 outcomes.

Comprehensive Reform Efforts

The four studies in the Comprehensive Reform Efforts section find mixed results. Pine and Mariage and Garmon report student gains on state achievement tests, and Mariage and Garmon also report improvement measured by curriculum-based tests. Neither of these studies employs control groups with random assignment despite their obvious intentions to determine the impact of the reform on student achievement. However, Pine compares the outcome trajectory of the PDS featured in his study to aggregated district performance over a period of time to provide a comparison. In addition, he compares PDS students' test results with those of students at a school in a more affluent community that might be expected to (and initially did) outperform the students from lower socioeconomic status in the PDS. Mariage and Garmon use statewide performance over time as a comparison for their PDS's performance, tracking the closing of the gap between initial district and state scores. Whether the differences these studies find, some quite dramatic, are related to PDS activities or to some other intervention may be questionable in some definitions of scientific research. Establishing a link is essential.

Not all studies in this set obtain positive results. Cowart reports gains in math and reading but a decrease in writing scores. Cooper and Corbin, perhaps the most comprehensive of the studies in this group, report no differences in achievement in 12 PDS and 12 non-PDS settings matched by key demographic variables. In this case, we might be tempted to conclude that, given the more rigorous study design with a matched comparison group, we can answer the student outcome question conclusively. Combining the data from 12 PDSs, however, may mask differences in the quality or developmental level of PDS implementation that might have been evident in single-site studies with in-depth description of partnership processes. In fact, a study that combines and compares multiple sites loses much of its ability to use contextual descriptions to make links between PDS activities and student outcomes. Given the myriad

Table 11.1. Comparison of Documentation, Outcomes, and Evidence for Linkage in Studies in This Book

Chapter/ study author	Documentation of student learning	Student outcomes	Evidence for linkages
Pine	State achievement tests (MEAP)	Gains in math and reading over 10 years	Comparisons with district and state test results Comparison with affluent school Analysis of PDS documentation
Mariage & Garmon	State achievement tests (MEAP)	Increased scores and narrowing of gap between district and state average	Comparison with state achievement scores
	Curriculum-based measures	Increase in percentage of students in reading and math performing at grade level Decrease in percentage of students reading below grade level Increase in writing productivity	Analysis of targeted professional development (writing intervention)
Cooper & Corbin	State achievement tests (MSPAP)	No difference in student achievement in PDS and non-PDS schools	Matched comparison schools design Grant report analysis
Cowart & Rademacher	State achievement tests (TAAS)	Overall increase in percentage passing math and reading but a decrease in writing	Analysis of preservice teacher professional development in categories set by K-12 students
	Attendance data	Improved attendance	
Brown et al.	Norm-referenced national reading subtest (Stanford) Degrees of Reading Power test (DRP)	Improved reading achievement scores	Matched comparison group design Analysis of partnership activities

Continued next page

Table 11.1. *(continued)*

Chapter/ study author	Documentation of student learning	Student outcomes	Evidence for linkages
Trathen et al.	State achievement reading subtest (NCEOG) Informal reading/ skills inventories (WRI, IRI)	Improved reading scores on formal and informal tests	Analysis of partnership activities Case-study analysis
Dickson & Bursuck	Reading and spelling skills tests	Improved reading skills proficiency	Observation logs Teacher survey
Knight & Boudah	Archival data Systematic classroom observations (SOS)	Increased secondary student engagement Fewer off-task behaviors Increased absenteeism	Teacher interviews Action research projects
Sagehorn & LeTendre	Multiple action research measures	Gains in targeted student performance in 9 of 11 action research projects	Teacher analysis in action research projects

influences on schools, teachers, and students, design alone will not necessarily remove alternative or competing explanations of study findings.

The Cooper and Corbin study also raises another issue. We tend to assume that PDSs must outperform non-PDSs in order to be considered successful, but this may not be the case. In an environment where new teachers are prepared and compete with K-12 students for the attention of practicing teachers, even a finding of no difference in PDS and non-PDS students' test scores may be interpreted as a positive result.

Targeted Curricular Reforms

The three studies focusing on partnerships with targeted curricular reforms are similar in several ways. They all address reading performance and instruction, use multiple measures to determine impact on students, and report positive student outcomes. The attention to reading instruction probably reflects the recent concerted national emphasis on literacy, but it also demonstrates the variety of ways in which literacy goals are approached. Two of the studies focus on special education students. The other study (Brown et al.) includes a comparison of its results with a matched non-PDS site. Brown and her colleagues find higher fourth-grade reading achievement in the PDS setting than in the matched non-PDS fourth grade. The Dickson and Bursuck study is more narrowly targeted than the other two in this group, focusing on discrete reading skills of special education students. Trathen et al. also focus on reading achievement in special education and report positive findings on a variety of measures, including statewide assessments. These studies suggest that it may be easier to demonstrate positive K-12 impact in more focused areas—or that studies that establish positive impact are more likely to be submitted for publication. Nevertheless, given a focus on a specific skill and documented improvement in that skill after the intervention, particularly compared to a similar group that did not receive the treatment, the reasoning connecting intervention to outcome is not difficult to establish. Without the comparison group, one might be able to suggest alternative reasons for the changes, creating more difficulty in isolating convincing connections.

Action Research

The two action research studies that make up the final section of the book are more difficult to categorize in relation to student outcomes because the studies are more diverse in intervention and outcome indicators. Sagehorn and LeTendre report gains in targeted student performance, measured in various ways, in 9 of 11 action research projects. It is difficult to gauge the quality of the studies, however, without knowing the inquiry processes of individual teacher-researchers.

In contrast, the Knight and Boudah study focuses on the collaborative research process as a professional development activity for teachers. Student achievement on tests is not measured in their study. Instead, they hypothesized that the inquiry process would result in changed behaviors of teachers, which would increase students' active involvement in the classes of the teacher-researchers. Therefore, they focused on observed student engagement or involvement, which research suggests is related to student achievement (Good & Brophy, 2000). Although an attempt was made to compare the teacher-researchers to a matched group of teachers in the same school, these efforts were ultimately abandoned because the comparison group became interested in the research of their colleagues and ultimately engaged in many of the same activities as the teacher-researchers. The study exhibits mixed results: positive findings for student engagement, but increased absenteeism of targeted students. Mixed results increase the difficulty of identifying linkages between partnership activities and student outcomes. However, they have the potential to engage teacher-researchers in discussions and reflections about the reasons for the contrasting results and therefore incite valuable professional growth.

Lessons Learned

What can we learn from these nine studies that focus on K-12 student outcomes? At the very least, we can gain insights into the current state of research in school-university partnerships, including the strengths and weaknesses of study design, the way challenges to research are (or are not) overcome, and the success of different ways to identify connections between the partnership activities and the K-12 students they serve. Lessons related to these three areas are discussed in the following sections.

Design and Methodology Issues

As a group, the studies may not reflect the design characteristics expected by researchers following the "criteria for rigorous research" outlined by Wilson, Floden, & Ferrini-Mundy in their synthesis of research on teacher education (2001, p. 38). No experimental designs with random assignment are used, and only a third attempt quasi-experimental designs. Only three of the studies—Brown et al., Cooper and Corbin, and Knight and Boudah—include comparison groups in their designs, although Knight and Boudah were unable to maintain the comparison. Few sophisticated statistical analyses are used. At times, the dependent variables used seem very remote from the activities implemented in the partnership. Yet while one might be tempted to decry the poor state of educational research in general and teacher education research in particular, that conclusion is far too simple. Consider the conditions that exist in partnerships, perhaps in schools in general, that preclude successful use of more traditional designs. It should be noted that the one study that most closely meets the standards for scientific rigor in this collection (Cooper & Corbin) was not conducted in a partnership setting while school and university faculty simultaneously were implementing activities. Instead, the study focuses on existing partnerships and archival data in order to determine post hoc the impact of seemingly anonymous PDS work. No relationships were at stake, no trust issues surfaced, no questions of equity in treatments were raised, and there were no familiar faces to match to standardized test scores or measures of teacher effectiveness.

The studies, at a minimum, are instructive and help us push forward some ideas about the nature of research in school-university partnerships. Each of the studies goes beyond the anecdotal reports so often associated with partnership writing. Nevertheless, there are many trade-offs associated with research in school-university partnerships. As has been documented in earlier studies (Andersen & Herr, 1999; Knight et al., 2000), when teachers are involved, the traditional research processes may change. In particular, the issue of control or comparison groups may be problematic, because teachers often view the exclusion of groups of students or teachers from participation in interventions as unfair even when they are offered the opportunity to participate at a later time (Knight et al., 2000). The contamination of the comparison group created as a result of collaboration with the teacher researchers in the Knight and Boudah chapter illustrates this problem.

Given this perspective, how can we design studies acceptable to the research community that participants also consider fair and equitable? How can we determine whether our partnership activities, as opposed to other events, are making a difference? Several of the studies in this book respond to the need for comparisons by using state or district means for student scores on standardized tests or expected student growth. Some depend on the convergence of participant perceptions to make connections. Others provide carefully constructed, data-based analyses of the trajectory from teachers' professional development to students' outcomes. The section on Making the Link in this chapter describes in more detail the ways that researchers in these nine studies compensate for weaknesses in research design seemingly imposed by the nature of partnership work.

Overcoming Challenges to Research

The preceding sections of this chapter, as well as numerous other articles (e.g., Teitel, 2000), chronicle the challenges that confront educators who work together to improve teaching and learning and at the same time are expected to evaluate the impact of their labor. These challenges include, among others, the threat to relationships that evaluation poses, the risk of exposing negative or nominal impact in a political climate that demands proof of positive impact, and the labor- and resource-intensive nature of collaborative work that leaves little time for research. Nevertheless, the nine studies in this book provide some evidence that school-university partners can study the impact of their collaboration on K-12 students and make a convincing case for positive impact. As the Committee on Scientific Principles for Education Research (National Research Council, 2001) reminds us, research is more than design and methods. Knowledge is built not from the results of a single study but from the careful reasoning from data across studies and over time. In the case of complex interventions undertaken by school-university partnerships, this "careful reasoning" may be needed within as well as across studies. Therefore, while we can use this collection of studies for the obvious purpose of learning more about the connections between partnership collaboration and student outcomes, we can also learn more about how research can be conducted to build our knowledge base without destroying the collaborative vehicle that drives the intended improvement.

The researchers in this book overcame challenges to their studies in several different ways. Some sites reduced the threat to working relationships by involving school- and university-based participants in some or all phases of research and evaluation. The action research studies are particularly good examples of this teacher involvement and have the potential to heighten awareness and appreciation of the value of systematic study of our actions. They may be of particular use in the study of K-12 student outcomes, because they are closely linked to the students in classrooms, where learning occurs, and have the potential to provide more specific and immediate information about the impact of curriculum and instruction interventions. However, they also carry the potential danger of faulty decision making based on poorly designed or implemented research. Even when done well, the studies as a whole may have a very limited scope of impact and dissemination and may seem fragmented. The challenge to this approach lies in determining and disseminating criteria for conducting teacher research and in building the research capacities of teachers, administrators, and university faculty who work in schools. The Sagehorn and LeTendre and Knight and Boudah studies describe how they accomplished this.

The second challenge is more political in nature and involves the potential that negative outcomes will be exposed through research. Schools and districts may be particularly sensitive to negative outcomes when they are trying to secure funds through bond elections or when they are in competition with charter and private schools. Similarly, schools and colleges of education that are engaging in partnership work as a result of pressure from state legislatures, governing agencies, or the media may have an equally strong interest in presenting the best side of their work. On a less political (but very human) note, stakeholders who have expended considerable effort and are invested in their work may feel that negative findings reflect negatively on them, making them reluctant to expose these findings to colleagues. The studies cited here reveal few negative findings and may reflect a bias in submission related to this issue: Only those with more positive than negative outcomes may have been willing to "go public" with their work. The exception is the Cooper and Corbin study that found no advantage for the PDS model. As previously mentioned, however, the researchers were not connected closely to the sites they studied. Perhaps one way of overcoming the challenge of negative exposure is to embrace negatives as a means of improvement and portray them as such to the public. We may find we can use the current political climate of accountability to advantage by proactively seeking areas of needed improvement revealed by our research and making a concerted effort to study and remedy the weakness. The recently formed Minority Achievement Network, a coalition of affluent school districts across the country, has taken this stance in regard to achievement gaps between different groups of students in their districts.

Another challenge confronting partnership researchers is related to the nature of the work of teachers and university faculty in partnership settings. Forging relationships, securing resources, and implementing partnership work are time-consuming activities. When they are added to the schedules of classroom teachers, administrators, and university faculty in field-based programs, the task becomes almost overwhelming. There is little time left for designing studies, collecting and analyzing data, and writing the results for dissemination. The authors of these chapters approached this challenge in different ways. Some secured external funding that enabled them to acquire additional resources and personnel. Others built the research and evaluation components into the activities of the partnership, and some engaged teachers in research.

Table 11.2. Types of Evidence Used by Nine Studies

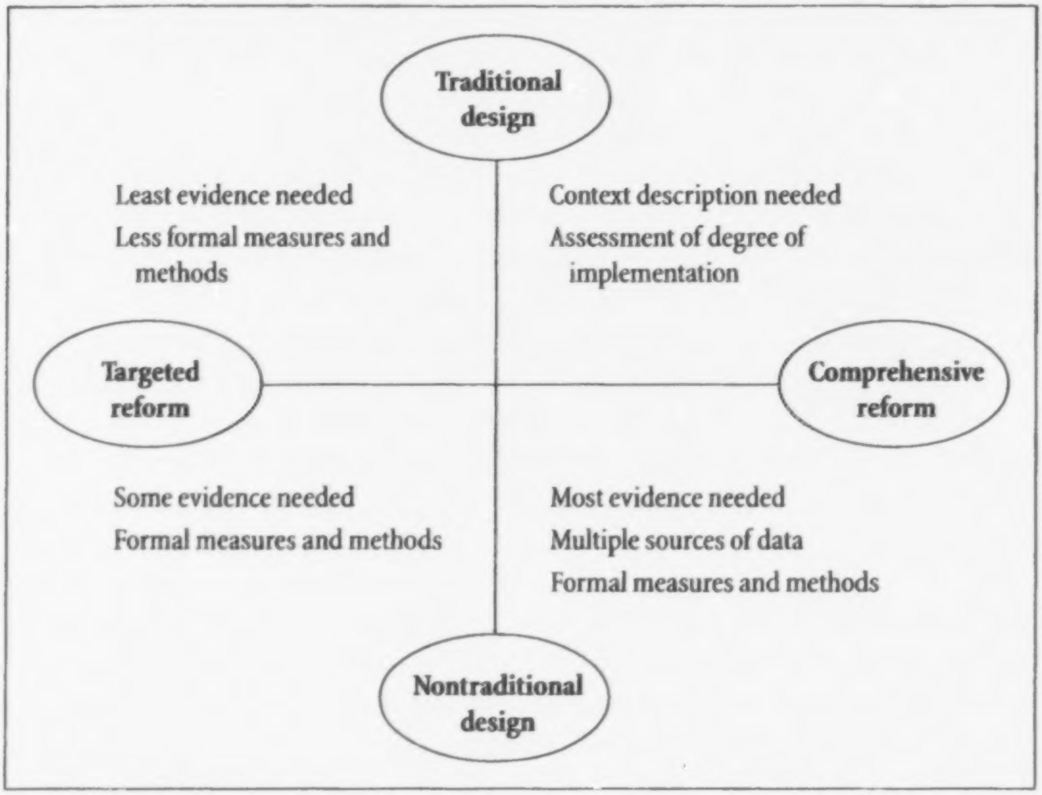
Matched comparison group outcomes
Comparison with district or state scores on standardized tests
Inservice and preservice teacher perceptions and reflections (surveys, interviews, focus groups, logs, minutes of meeting discussions)
Logical analysis of professional development and partnership activities
Student perceptions (surveys, individual and focus group interviews)
Formal and informal observations (student behaviors, performance, partnership activities)

Making the Link

How the studies garnered evidence that illustrates the linkages between activities and student outcomes may provide a view of the future of teacher education research in collaborative settings. Teitel (2000) provides a conceptual map that may be helpful in this process and that is used in several of the chapters. The authors of these studies probably would readily agree that it is difficult to make the connections, but they set about doing so all the same. Linkages involved documentation of the activities and behaviors of teachers and preservice teachers through systematic observations, surveys, and interviews. In several sites, comparable district or single-school test data were identified for purposes of comparison. In others, behaviors or perceptions of partnership teachers were investigated to establish linkages to student outcomes through logical argument. Several sites used preservice teachers' portfolios to tie their work to individual student outcomes. Table 11.2 summarizes the types of evidence of linkage used in the studies in this text.

The studies are instructive because they suggest a framework for considering what is needed to strengthen the case for linkages between partnership activities and student outcomes when more rigorous designs are not feasible. Other kinds of questions may produce different kinds of frameworks. Drawing on lessons learned from these particular studies, the focus of reform and the research design characteristics appear to dictate the type and extent of evidence needed to make convincing links in the chain of reasoning. Figure 11.1 depicts a grid that places partnerships on continua reflecting these two characteristics. Research design characteristics are anchored on one end of the continuum by rigorous designs employed in either quantitative or qualitative studies to reduce threats to internal and external validity (see, e.g., Borg & Gall, 1989). These include, for the most part, quasi-experimental or correlational designs involving matched comparison groups (more rigorous) or groups selected for convenience (less rigorous) or naturalistic/ethnographic designs that meet more rigorous criteria for these approaches (Denzin & Lincoln, 1998) as well as anecdotal reports (less rigorous). Few true experimental studies are conducted in

Figure 11.1. Assessing the Need for Evidence to Make Linkages


Traditional design
Least evidence needed
Less formal measures and methods
Context description needed
Assessment of degree of implementation
Targeted reform
Comprehensive reform
Some evidence needed
Formal measures and methods
Most evidence needed
Multiple sources of data
Formal measures and methods
Nontraditional design

educational research since random assignment to group is not feasible in most cases. Therefore, quasi-experimental studies featuring well-matched comparison groups represent stronger designs. Likewise, longitudinal, in-depth ethnographies meeting rigorous criteria are also rare in this body of literature, but those that exist represent stronger designs.

The other end of the research design continuum is characterized by less rigorous designs susceptible to criticism regarding their internal and external validity. These studies range from anecdotal reports and one-time case studies or post-only designs at the far end to nonequivalent comparison group designs and more in-depth qualitative case studies toward the middle of the continuum (see Borg & Gall, 1989, and Denzin & Lincoln, 1998, for discussion of design strength in quantitative and qualitative studies). As discussed earlier, rigorous designs may not always be feasible, possible, or even sufficient given the uniqueness and complexity of partnership contexts. While they remain our goal for both quantitative and qualitative studies, we may need to alter or supplement them in some way (Andersen & Herr, 1999).

The extensiveness of the reform focus defines the other continuum, with comprehensive efforts at one end and targeted curricular reform on the opposite end. Partnerships falling in the top left quadrant, characterized by more rigorous research design and targeted reforms, are less complex and require less evidence or less formal measures and methods to establish convincing linkages. The Brown et al. study fits in this quadrant. Given the rather singular curricular interventions characteristic of these partnerships and a design that most likely incorporates a matched comparison group or in-depth case study to qualify as rigorous, the relationship between partnership activities related to the curricular intervention and student outcomes in the same area is rather convincing with little additional evidence needed. Adding a research question focusing on qualitative description to quantitative studies would provide more data for reasoning about the nature and extent of linkages between interventions and outcomes. Likewise, a question requiring quantification of outcomes could provide evidence with which to compare participant perceptions.

Studies represented in the top right quadrant also use rigorous designs but focus on comprehensive rather than targeted curricular reform. The Cooper and Corbin study would be placed in this quadrant. As might be expected, they also require less formal evidence for linkages than the studies using less rigorous designs. Nevertheless, studies of this type present a different kind of need that differentiates them from the other studies. In this case, the comprehensive reform effort presents a degree of complexity that may render the design less appropriate than in the previous quadrant. For quantitative approaches, finding matched schools is often problematic, and looking at interventions in isolation of the others occurring simultaneously may be misleading. For these studies, extensive context description is needed in order to avoid "black-box" research, open to conflicting interpretations about the nature of the relationship between the multiple interventions and the outcomes, and to be able to assess the degree of implementation of the complex reform. For qualitative approaches, quantitative assessment of outcomes at various points would address questions of experimenter change or bias that might influence external and internal validity.

Continuing clockwise in Figure 11.1, we leave the realm of traditional research relying on comparison groups and enter the arena characterized by "weak" designs (Borg & Gall, 1989). In contrast to their counterparts in the top quadrants, reforms falling in the lower right quadrant—characterized by complex, comprehensive reforms and less rigorous designs—require more evidence from multiple sources of data using more formal measures and methods. Much PDS research falls in this category. Examples from this book include the Mariage and Garmon and Pine studies that establish linkages through use of state and district test scores over time as comparisons. On the other hand, partnerships in the lower left quadrant, with a focus on more targeted curricular reforms, require less evidence than those with a comprehensive reform focus, because their focus is more defined. Nevertheless, in the absence of a rigorous design, they also need to approach establishment of linkage using systematic, formal measures and methods of collecting additional data. The Knight and Boudah study falls in this quadrant.

Table 11.3. Formal and Informal Evidence of Linkages

Formal measures and methods
Comparison with district or state scores on standardized tests (post hoc)
Matched comparison school (post hoc)
Stakeholder perceptions of connections
Instruments: surveys, individual interviews by a neutral party, focus group interviews by a neutral party
Target groups: university and school faculty, university and school administrators, university and school students
Qualitative case study: participant observation, analysis of documentation, in-depth interviews
Informal measures and methods
Logical analysis of professional development and partnership activities by participants
Inservice and preservice teacher logs or journals
Anecdotal reports by participants
Analysis of PDS documentation by partnership participants
Informal observations by partnership implementers

In sum, the topography presented in Figure 11.1 illustrates that some combinations of design and focus require more evidence or more formal measures and methods to document linkages and make a case for the relationship between partnership activities and student outcomes. The quality and credibility of a study may well be judged not by design merits alone but by the quantity and quality of evidence supporting or refuting relationships between processes and outcomes. Table 11.3 lists formal and less formal evidence that may be used to assist in creating the case for linkages.

The Importance and Future of School-University Research

One has only to read some of the recent critical reports from within and outside the profession to know that our research priorities and processes are under great scrutiny. Several recent reports not only criticize overall research efforts in teacher education, they summarily dismiss the findings as weak and inconclusive (see, e.g., Abell Foundation, 2000). Even within colleges of education, the PDS and school-university research is often criticized. Clearly, some school-university research linkages may be more convincing than others, and some methods and approaches to research may be more valuable in some contexts than in others. Even so, the research associated with PDSs and school-university partnerships needs to be appropriately conducted and reported to gain credibility. Reports of negative as well as positive findings can enhance credibility and serve to improve efforts.

The research focusing on the impacts on student outcomes could benefit from suggestions brought forward by the Center for the Study of Teaching and Policy (Wilson et al., 2001) and the Committee on Scientific Principles for Education Research (National Research Council, 2001). These reports provide careful analysis of education research in general and teacher education research specifically, and they suggest several key design principles that should help answer important questions of policy and practice. Suggestions include the development of more appropriate descriptive tools to characterize teacher education, comparisons among plausible alternatives, inclusion of the importance of different contexts, explicit connections to student achievement and teacher outcomes, methods that control or test for key variables, and studies that are completed over time. Careful reasoning from evidence to interpretation within and across studies is critical (National Research Council, 2001). The review of nine partnership studies in this book provides some guidance about when and what kind of data are needed to assist in this reasoning process. The studies presented in this book are perhaps first steps toward developing a particular type of research in the unique settings that characterize school-university partnerships.

The impact of the partnerships on student achievement is an important issue related to accountability in teacher education. While pointing out the domains of future research in teacher preparation, Wilson et al. (2001) point out, "Research is needed to look at the range of ways schools and colleges collaborate in the context of teacher education, through PDSs or other means ..." (p. 35). This review and related work suggest that future teacher education research can be improved by critically examining what has been done in the past and by highlighting strengths and weaknesses of research and evaluation in the context of partnership work. There have been continuous calls to systematically collect and analyze data related to student learning since the school-university collaboration movement began, but there is still little published information about the impact (Book, 1996). There have been few models for systematic research and inquiry about how partnership relationships affect student learning, behavior, and attitudes—and fewer that address the problems underlying the paucity of research. The nine studies in this book provide examples of both innovative and traditional ways of measuring student outcomes and of collecting data that can strengthen evidence of the link between processes and outcomes.

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